R E P O R T R E S U M E S

ED 016 357 EF 001 009

CAMPUS DESIGN STUDY, DUKE UNIVERSITY.

CAUDILL, ROWLETT, SCOTT AND ASSOCIATES, BRYAN, TEX

PUB DATE NOV 63

EDRS PRICE MF-$0.50 HC-$2.56 62P.

DESCRIPTORS- *ARCHITECTURAL CHARACTER, *ARCHITECTURAL ELEMENTS, *COLLEGE BUILDINGS, *DORMITORIES, *SCHOOL ARCHITECTURE, BUILDING DESIGN, CAMPUS PLANNING, COLLEGE HOUSING, SCHOOL LOCATION

THE STUDY OF THIS UNIVERSITY DEALT PRIMARILY WITH THE WEST CAMPUS IN WHICH MAJOR FUTURE GROWTH WOULD OCCUR. PART 'A' CONSISTS OF AN ANALYSIS OF THE EXISTING ARCHITECTURE WITH RECOMMENDATIONS FOR FUTURE DESIGN CRITERIA. CHARACTER IS ANALYZED IN TERMS OF--(1) VERTICALITY, (2) SCALE, (3) RICHNESS, AND (4) VARIETY AND UNITY, WHILE ARCHITECTURAL COMPONENTS SUCH AS--(1) STRUCTURE, (2) MATERIALS, (3) COLOR, (4) ROOFS, AND (5) WINDOWS ARE EXAMINED IN TERMS OF EXPRESSION. FACTORS OF COMPOSITION RELATED TO THE CREATION OF VOLUME AND SPACE FORM THE LAST SECTION OF THIS ANALYSIS. PART 'B' IS A CASE STUDY ILLUSTRATING THE APPLICATION OF THE DEVELOPED CRITERIA TO A SPECIFIC PROJECT--A PROPOSED GRADUATE STUDENT CENTER. DEVELOPMENT IS TRACED THROUGH THE STAGES OF--(1) PROGRAM CREATION, (2) SITE AND LOCATION ANALYSIS, (3) PROJECT DESIGN, AND (4) CRITIQUE AND FOLLOW-UP. PLANS, ELEVATIONS, AND CONCEPTUAL SKETCHES AND DIAGRAMS ARE INCLUDED. (MH)

ED016357

DESIGN STUDY DUKE UNIVERSITY

CAMPUS DESIGN STUDY

DUKE UNIVERSITY

A review of the existing design features of the Duke West Campus, and recommendations for design criteria to be incorporated in future planning and building.

FOR

The Building and Grounds Committee
Of The Board of Trustees

Frank O. Sherrill, Chairman
Robert W. Bradshaw
J. Welch Harris
Gerhard C. Henricksen
J. Raymond Smith
Fred Von Canon
John Dozier, Secretary

BY

Caudill, Rowlett and Scott
Architects - Planning Consultants
Houston, Texas November 1963

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ACKNOWLEDGMENTS

We are grateful to many officials and faculty members of Duke University who assisted and encouraged us in this Design Study. Among those who were most directly involved in this project are the Building and Grounds Committee of the Board of Trustees, Frank O. Sherrill, chairman; Mr. Gerhard C. Henricksen, Vice President for Business and Finance; Mr. John Dozier, Business Manager, responsible for physical planning; Mr. Henry Mayfield, University Architect; the Educational Facilities Committee, Dr. Frank T. de Vyver, chairman; and the Graduate Center Subcommittee, Dr. Richard Predmore, chairman. We are also grateful for the suggestions made by Dr. Deryl Hart, President Emeritus, Vice President Everett H. Hopkins, and many others to whom we apologize for omission from this brief list.

We are indebted to Professor Bill N. Lacy and Professor Anderson Todd of Rice University for their major role in developing the basic substance of the analysis and the ground work for many of the recommendations in this report.

CONTENTS

Page

INTRODUCTION. 1

PART A ANALYSIS & RECOMMENDATIONS 3
INVENTORY 3
THE PAST 4
THE FUTURE 5
CHARACTER 8
Verticality 10
Scale 11
Richness 13
Variety and Unity 15
COMPONENTS 16
Structure 17
Materials 19
Color 21
Planes 22
Roofs 23
Windows 24
COMPOSITION 26
Additive Quality 27
Joinery 28
Spaces & Voids 29
Termination 31
Plans 33
FOLLOW THROUGH 36

PART B CASE STUDY 39
PROGRAM 40
ANALYSIS 42
DESIGN 43
CRITIQUE AND FOLLOW-UP 46
PROPOSED GRADUATE CENTER PLANS 47

INTRODUCTION

Duke University is faced with the problem common to all major colleges of the United States -- GROWTH. Its reputation for academic excellence has made this growth inevitable. This and the desire to upgrade the present facilities to accommodate new educational techniques have caused an expansion in the physical plant of the university. This design study was initiated by the administration in an attempt to answer some of the problems of how to grow in size and efficiency, without sacrificing the beauty of the natural landscape, the unity of the campus and the heritage of existing buildings.

The basis for such a study was succinctly stated by John Dozier, the University Business Manager, when he said,

> "The vitality, imagination and philosophy of a university can to some extent be measured by the concepts of the campus master plan and the quality of the individual buildings."

The truth of this statement is unquestioned and a tribute to the foresight of the present administration. However, no study or plan can in itself provide release from continuous evaluation and thought in the planning of the growth of Duke. Observations can be made, guidelines can be proposed, and possibilities put forward, but the successful translation of these ideas into a great campus must rest in the hands of those with authority and dedication to make thoughtful decisions regarding such proposals.

The Duke campuses have reflected a desire for quality in architecture since inception, but some of the recent addi-

tions to the university fail to fulfill the high standards established by the founders. This provides evidence that good architecture -- architecture of quality -- is not dependent solely upon materials, style or ornament, but also upon sensitive and balanced programming and design.

The campus which Duke deserves and requires can be attained only by capable architects working harmoniously with the Building and Grounds Committee of Duke University. This committee has the responsibility of final approval after their recommendations are accepted by the Board of Trustees of Duke University.

For the purposes of this design study, it was decided to deal primarily with the west campus. This was done on the premise that it is the logical area where the major future growth should occur. The Woman's College or "Colonial Georgian" part of the campus is now separated by distance, and will soon be more isolated by proposed freeways. The Woman's College will undoubtedly continue to fulfill its present role as an important part of the total Duke educational facilities, but any required additions to it should evolve from the planning and architectural style already established there.

The study is presented in two parts. Part 'A' contains an analysis of the characteristics of the west campus and recommendations for design criteria which should be incorporated in future projects. Part 'B' contains a case study illustrating the application of these criteria to a specific project: a proposed Graduate Center.

PART A

ANALYSIS & RECOMMENDATIONS

INVENTORY

A listing of characteristics of Duke may be of help in formulating a common basis for the ensuing conclusions of this report:

Large tracts of land -- ample for the expansion of a growing university.

Beautiful, rolling terrain, densely wooded and superbly landscaped.

Strong architectural unity through steadfast adherence to a formal axial plan, and consistent use of materials.

A magnificent chapel -- symbolic and awe-inspiring on a grand scale.

An attractive woman's college -- orderly and contained.

An outstanding reputation as the scholarly institution of the southeast.

Desire for a strong master plan to promote future growth with order and beauty.

The public image of Duke as a beautiful university campus.

Two separate but connected campuses serving one student body.

A row of unrelated new red brick buildings on the western perimeter of the campus.

Several architectural styles -- all of which are unsatisfactory as a continuing motif for different reasons: function, aesthetics or economy.

GOTHIC WEST CAMPUS

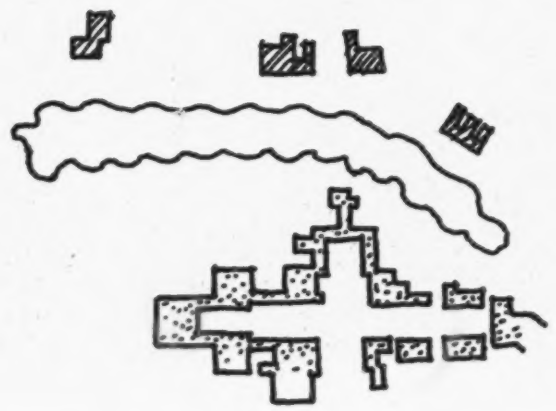
GEORGIAN WOMAN'S COLLEGE

THE PAST

Duke University is committed to quality in education and architecture. Possessing one of the most beautiful sites in the country, those who established the west campus seemed determined that the original buildings should match the beauty of this setting. It was patterned after other eastern campuses but with a character uniquely its own. The buildings were designed from the outside in, striving more for beauty than for function and economy. The goal was realized. The central spaces have few peers in collegiate planning for beauty and order. But minimizing the functional aspects has made necessary extensive renovation or planned renovation of almost all the original buildings at an exorbitantly high cost.

When the original buildings were built around a rigid formal plan, the problem of growth was a distant one. They were built in an era when the expansion of educational facilities was slow and needs easily foreseen. Today a more flexible attitude is required in which we accept rapid growth and change as the normal process of events and plan with a flexibility that allows future decisions rather than dictates them.

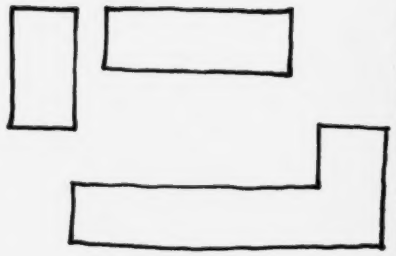
The rising cost of duplicating the original architectural style, along with its functional shortcomings brought a demand for more economical construction and a more workable plant. The completion of the Gothic quadrangle conditioned the feeling that adherence to the original style was no longer required to achieve aesthetic satisfaction. A recent plan sought to satisfy these considerations by establishing a "greenbelt" or visual barrier beyond which freedom to build without dedication to a style would be permitted. However, it has now been realized that the resulting divergent building types cannot live compatibly on the same campus even when not viewed simultaneously. Unity of environment and unity of academic purpose and ideals are not that easily separated.



THE FUTURE

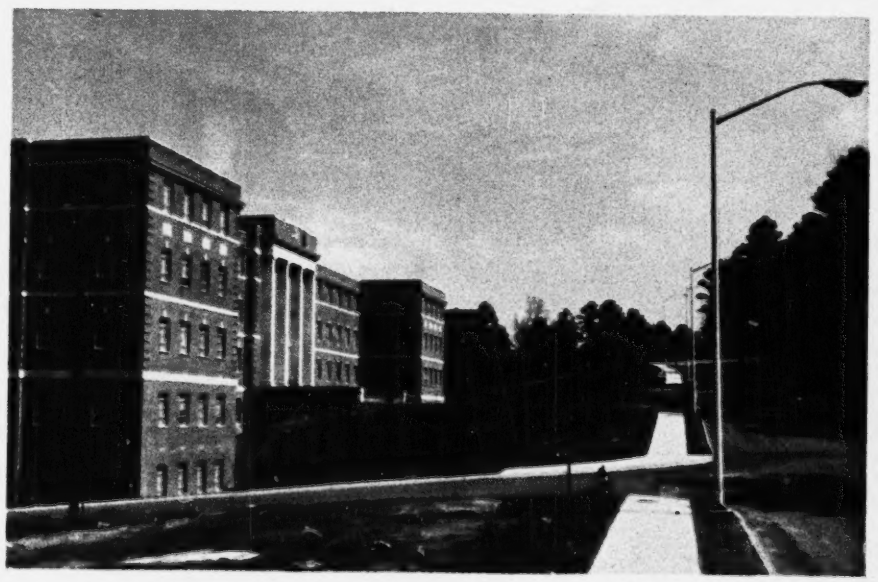
A campus is composed of exterior rooms as well as interior rooms. Anytime more than one building is built, an exterior space is formed which may be more important in establishing the environment than the buildings themselves. The quadrangle of the Gothic campus illustrates this point vividly, and justifies the belief that future placement of buildings should also stimulate the creation of good spaces, approaches and vistas. Future plans should be concerned with appropriateness -- to site and function as well as to materials and style, for the siting of the buildings dictates the form and organization of these important outdoor rooms. The new campus plan must deal with the challenge of developing secondary groups of buildings interconnected by both natural and man-made landscape elements as visual links between groups. Such planning should promote cohesiveness of the campus and recognition of the visual relationships and composition of the buildings that exist. The four red brick buildings recently built made no such attempt to define exterior spaces into quadrangles or exterior rooms.

So far, we have discussed generically the predicament of Duke University. Now we will proceed to specific items which should point toward the evolution of a new era of architectural planning and beauty for the campus. It should be emphasized again, however, that the successful use of this analysis will be dependent on how well the above points are followed. First, the programming and siting of the buildings must be right -- then the architecture can reinforce the choice. "For every hundred men who know how to build a wall, only one knows where to put it."



OUTDOOR ROOMS

UNDEFINED SPACE



In the following discussions and illustrations of the divergent elements of Duke architecture, evidence will be followed to essence, and from this essence the direction will be pointed to solutions. Instead of finding the solution, a choice of solutions should spring from the greatest of individualizing sources -- imagination. It should not come from the repetition of Georgian brick buildings or stone Gothic per se. These styles should not be a refuge for an expedient solution but rather serve as a stimulus for a direction. The final selection of each project design must result from thoughtful participation by Building Committee, client, and architect in exploring all the possibilities suggested by the functional program and the spirit of the Duke campus. The essence of the Gothic style can serve as the springboard for a period in the building growth of Duke that will equal and perhaps excel that which has gone before.

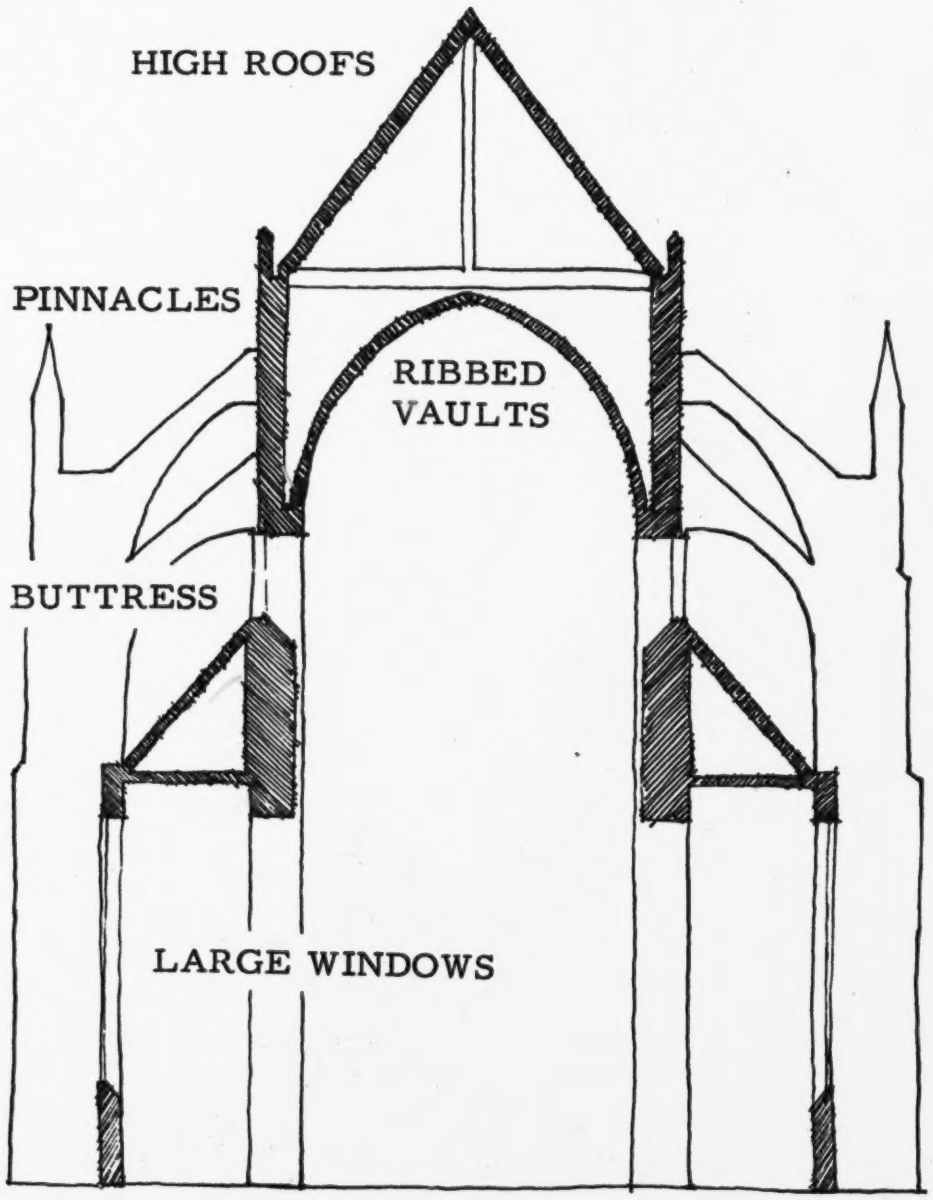
The analysis and recommendations are arranged in three broad categories: (1) CHARACTER, or the essence of the environment, (2) COMPONENTS, or elements which shape the environment, and (3) COMPOSITION, or the arrangement and assembly of the components.

The recommendations cannot be reduced to one permanent formula devised to set the style of Duke buildings. Such an approach has resulted in the present dilemma. What we do propose is to submit an architectural "vocabulary" from which to draw components and suggestions as to how they could be composed to achieve the desired campus character. The selection of "words" from this vocabulary should depend on the imagination of each architect and the Building Committee as they solve each individual building program. The choice would also be dependent on location, the relationship to existing Gothic buildings, and topography. For ex-

ample, a building to be located in a valley might use a pitched roof, where a building which would never be "looked down on" could utilize a flat roof with the "battlement" reflected in its silhouette. A building to be located within view of existing Gothic buildings might follow more closely the existing proportions, color and texture than one located elsewhere. Yet, within the discipline of this vocabulary, the seemingly opposite goals of variety and unity could be achieved, architects could arrive at imaginative design solutions, and generic buildings could appear on the campus, without a loss of design continuity.

Of course, the vocabulary will change as does technology, overcoming a basic weakness of a "style formula". Obsolete components will be dropped and replaced with new ones which are in keeping with the times and the Duke spirit. For example, leaded glass may be replaced with gray glare reducing glass, laid stone walls may give way to precast panels, heavy tile or lead roofs might yield to a lightweight material of similar appearance.

CHARACTER



CHARACTER

The original Gothic architecture had its beginning around the middle of the twelfth century. The unique structural and decorative characteristics of this style found their purest expression in the cathedrals, and are familiar to all: high roofs, ribbed vaults, the pointed arch, large window areas divided by traceries, decorative structural and functional elements, verticality instead of horizontality. All these have appeared in the following centuries in revival after revival of the style. Because its vertical expression seemed to best symbolize not only lofty spiritual aims but the equally high ideals of education and knowledge, it was adopted by many universities. In a period of eclecticism it was the logical choice because of the precedence of such universities as Oxford and Cambridge. With the implications of verticality and deep roots, universities hoped to achieve "instant" tradition. Duke's decision to build in this style was understandable, and the reasons behind such a decision still have a certain validity.

The original buildings on the Duke west campus, and notably the chapel, most closely resemble those built early in the decorated Gothic period of English architecture, in the 14th century. Many of the colleges on the Oxford and Cambridge campuses were built during that period. Although many of the details of the Duke buildings are faithful to the Gothic tradition, the way in which they are assembled and the overall plan depart in some important ways from basic Gothic planning. Most of these are the result of the difference in the basic approach. The original Gothic buildings were planned from the inside out, functionally, and were generally not symmetrical in external appearance. In the later revivals an opposite approach was used, with functions forced into a "Gothic" form. During this process of facade design

the asymmeterical aspects of the earlier buildings (which had their reason in the plan) lost their significance and the facades tended to become more symmeterical. The same tendency is apparent in the plan arrangements of building groups.

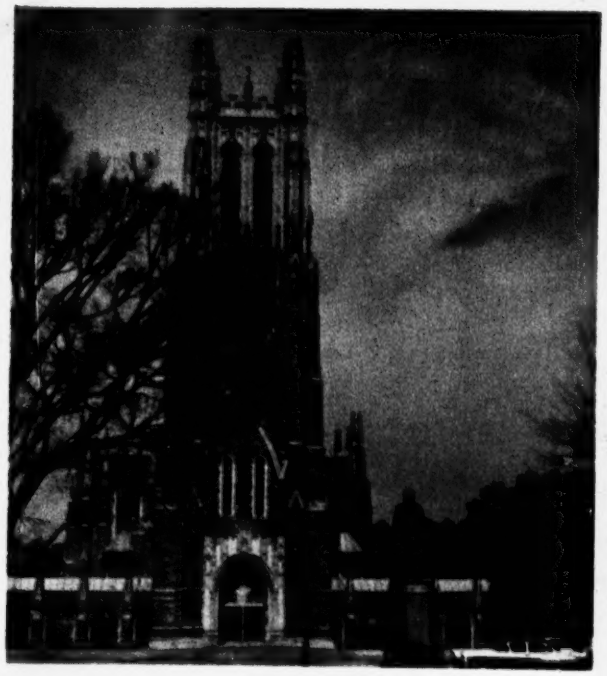
The exact duplication of Gothic details requires, as it did in the fourteenth century, a high level of hand craftsmanship which is not readily available today. We do have available a machine craftsmanship which is exceptional in many instances. Our problem is to retain the quality and spirit of Gothic architecture at Duke and translate it into present-day materials and methods without departing from the richness, scale and beauty of the present campus buildings.

Recommendations. The essence of Gothic architecture was the honest expression of plan and structure, and this functional approach must be the determinant of the future architectural character. From this foundation the use of materials and their enrichment must recapture the consistent human scale and the great variety of form and composition, along with the unity of proportion, color, and texture which is the essence of the Gothic style and of the Duke campus. In brief, future buildings must result from a problem-solving approach which pays deference to certain characteristics inherent in the original Gothic buildings and in the Duke architectural tradition. These inherent characteristics may be classified as:

Verticality
Human scale
Richness
Variety
Unity

and are discussed in greater detail on the following pages.

Richness, Scale, Beauty --
Detail From Chapel Doors



THE DUKE CHAPEL

VERTICALITY

Foreshortened View of Vertical Elements

VERTICALITY

If architectural design could be divided into two categories it would be found that most buildings have either a horizontal or vertical expression, whether accomplished by size, scale, structure or fenestration. The vertical suggests the noble, the dramatic, the aspiring . . . the horizontal suggests serenity, repose, earthiness. The romantic choice of the vertical for Duke seems appropriate to the aims of the university and one which is called for by the landscape and dense pine forests. The tall vertical bundles of tree trunks complement the vertical elements of the Gothic-designed buildings. The elements that establish this vertical feeling are the "measuring" devices within an essentially horizontal composition --- the vertical proportion of windows, panels, shadows, towers or structure.

Recommendations. The vertical feeling should be expressed wherever possible and emphasized where feasible. Consideration should be given to the foreshortened view one will see while walking past the buildings. It is in these foreshortened views that the vertical impact is most noticable in the quadrangle, as plan projections, pilasters, and gabled building ends catch the eye. The vertical elements most readily expressed are columns. Plan components such as stair towers, pipe chases, various types of rooms may be off-set to achieve a vertical break in the building and cast vertical shadows on adjacent surfaces. All entities such as windows, doors and wall panels should be given a vertical proportion where possible. Where the overall width of a group of windows or doors exceeds their height, they should be detailed to read visually as a group of vertically proportioned entities rather than as one horizontal element.

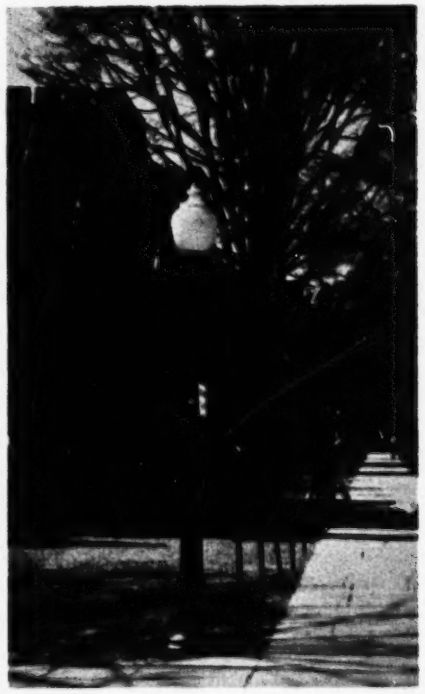
SCALE

The over-all scale of the campus will depend ultimately on whether the university plan will be based on a pedestrian scale or an automobile scale. The distances in the existing Gothic quadrangle are pedestrian distances and it is possible for the campus to grow in such a way as to maintain this relationship. Although the university possesses enough land to spread out in all directions, there may be a good reason to plan for higher student density so that the pedestrian scale of the campus can be retained.

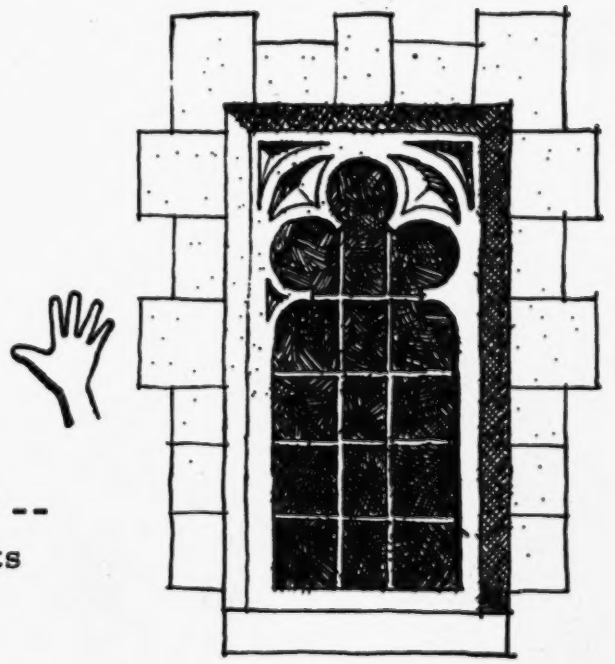
If the automobile dictates the campus scale, it could become a sprawling, disconnected and unrelated scheme. When this happens, a campus takes on a "filling station" character, in a sense, with Biology and Engineering instead of Texaco and Humble. The design of the outdoor rooms becomes an entirely different matter if they are to be a view from a speeding automobile, instead of a space in which people walk.

When approaching the campus, the scale is dominated by the centrally located chapel spire and the mass of the medical group to the northeast. To complete this composition of distant scale some tall elements may be needed to the south. The individual scale of the older buildings is faithful to the Gothic, which was based on the size of a man's hand. The human hand can span almost any unit of a Gothic building. This is one of the roots of its appeal and the reason that even the loftiest cathedral still retain a sense of human scale. The larger elements and the proportions are generally no larger than the height and width of a man. This also explains why the Gothic style is a style that permits a house and a cathedral to be equally successful where scale is the consideration.

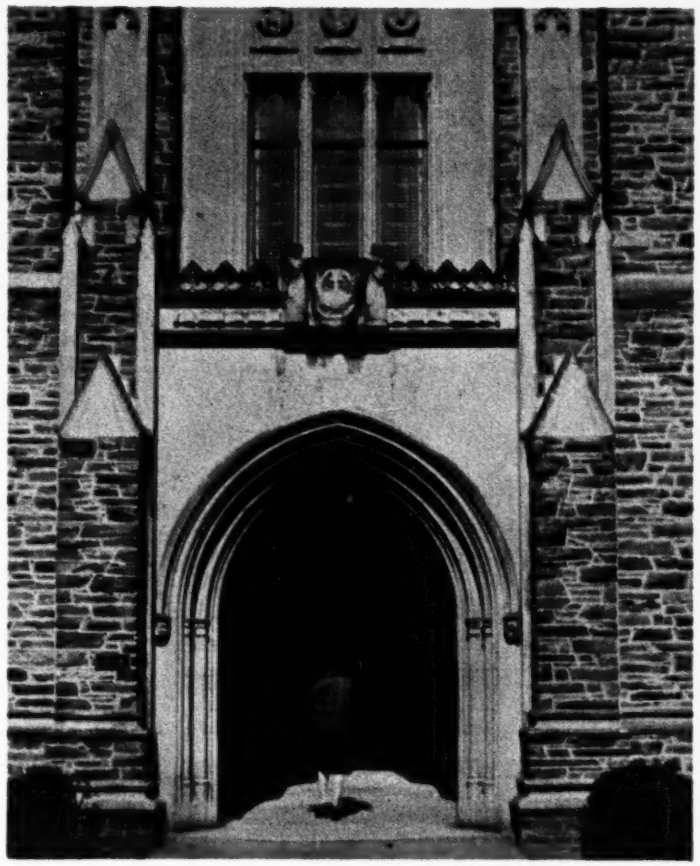
PEDESTRIAN SCALE



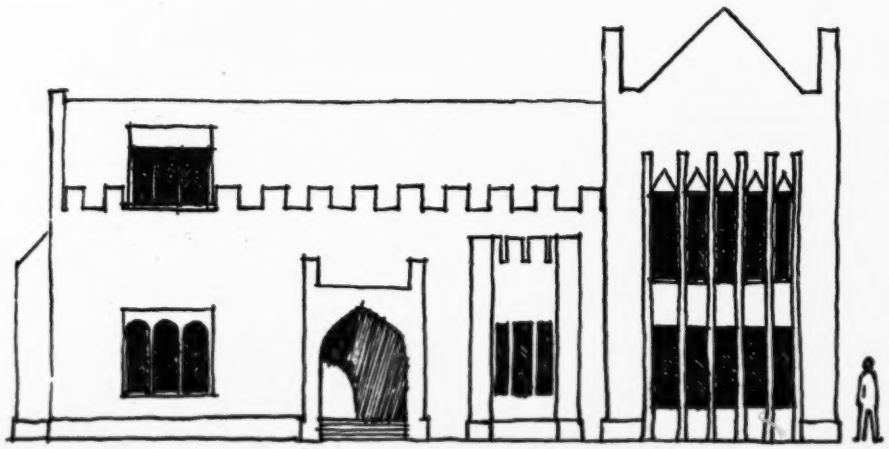
AUTOMOBILE SCALE



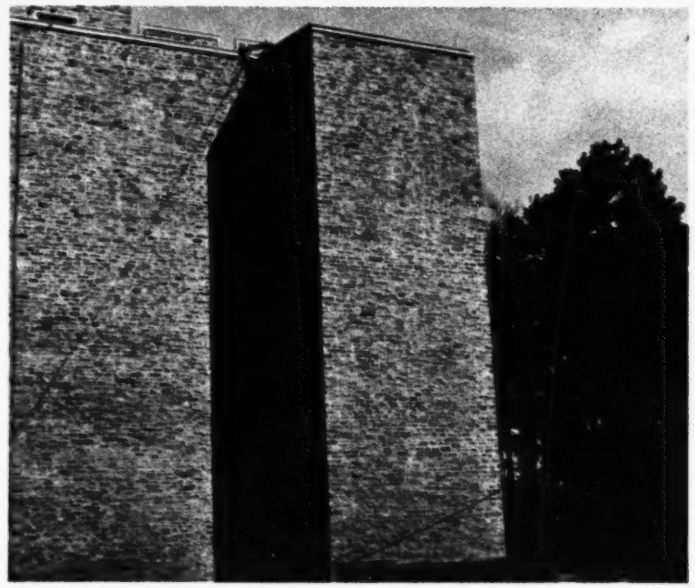
HUMAN SCALE --
Hand-Sized Units



Grouping of Smaller Elements
Maintains Human Scale.



Unfortunately, the human scale has been lost in some of the more recent stone buildings, where massive walls without enrichment or relief become overpowering instead of intimate in scale.



Massive, Unrelieved
Walls Overpower
The Human Figure.

Recommendations. In all views the buildings must readily relate to the human being. This relation to human scale can be most readily achieved at the level of the smaller symmetrical entities such as windows and doors. It is at this level that people relate more quickly and personally. When these components must occur in large numbers they should be grouped and detailed to read as human sized and usable elements. Placement as determined by function rather than for symmetry will usually reinforce the human scale. Large, uninterrupted planes should be broken up into more human size elements through emphasis of joints, shadows, and the size and texture of the units or aggregate used. A steadfast expression of the structure will also help prevent massive and inhuman scale.

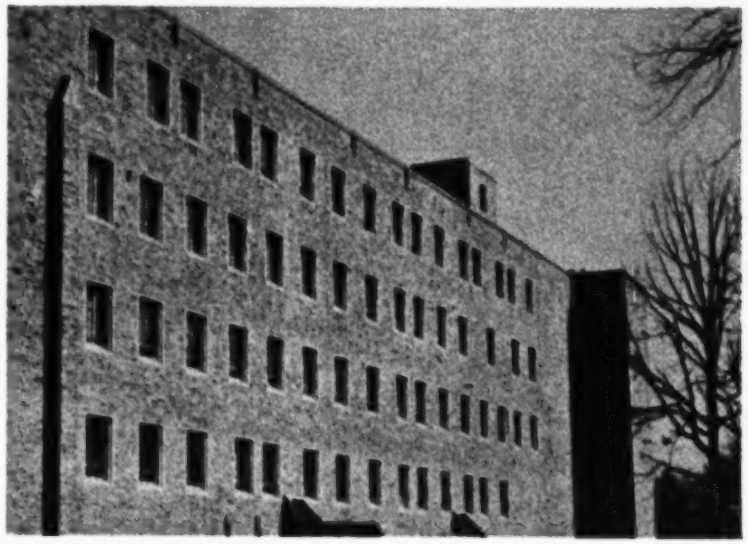
RICHNESS

Ornament and decoration were essential features of the original Gothic style and were used in the buildings here. In each succeeding building one observes the diminution of ornament because of the prohibitive cost of duplicating the ornate carvings designed for hand craftsmen, and now being executed by machine production. As the ornamentation decreased so did the richness of the style. Plain windows set into plain walls suffer by comparison with their sister buildings and give the impression of prison-like severity against a background of richness.

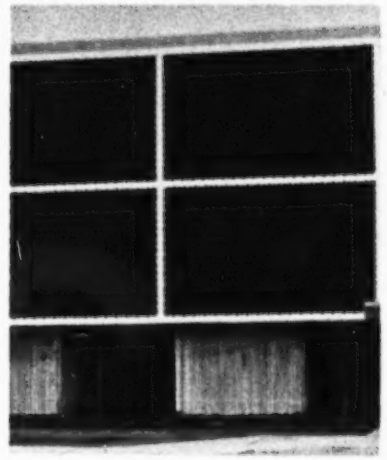
Contemporary architecture often fails to solve this problem of the desire for decorative quality within the bounds of budget limitations. The popularity of the sun screen that swept the country was one instance of this, where the grille's role as a sun control device became secondary to its use as a means to enrich the style. Ornament is a means of giving definition and human scale to a component of the architecture. Without it, buildings become scaleless, and lifeless. Present-day standards do not demand the same abundance of ornament that some preceding styles had, but a sense of human scale and proportion is still a requisite.

An essential trait of Gothic ornament was the "undercutting" of the parts to give crisp and linear shadows of small scale. This increased the effect of the nterplay of planes in light, shade and shadow. This can still be done today, but in shapes more adapted to machine execution and modern construction.

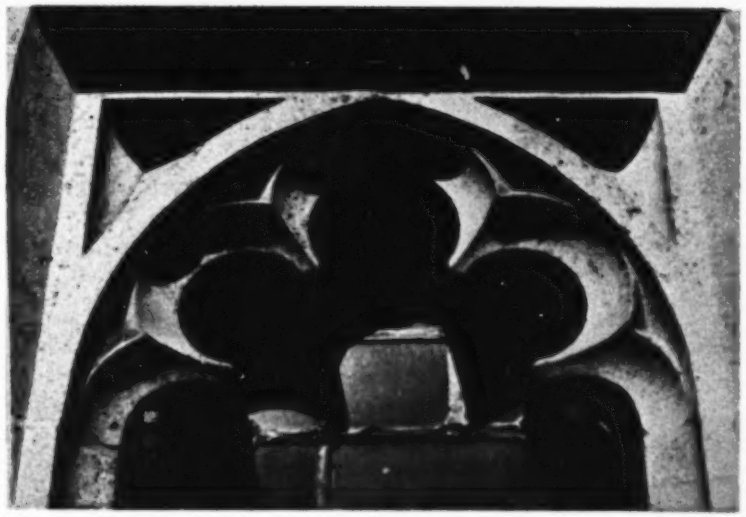
Gothic ornament was never applied surface decoration but rather enrichment of essential elements. There is a parallel between this and contemporary ornament in which ornament assumes a new vocabulary and expression dictated by the methods of its construction. Structure, joinery and termination points become the ornament of present-day building.



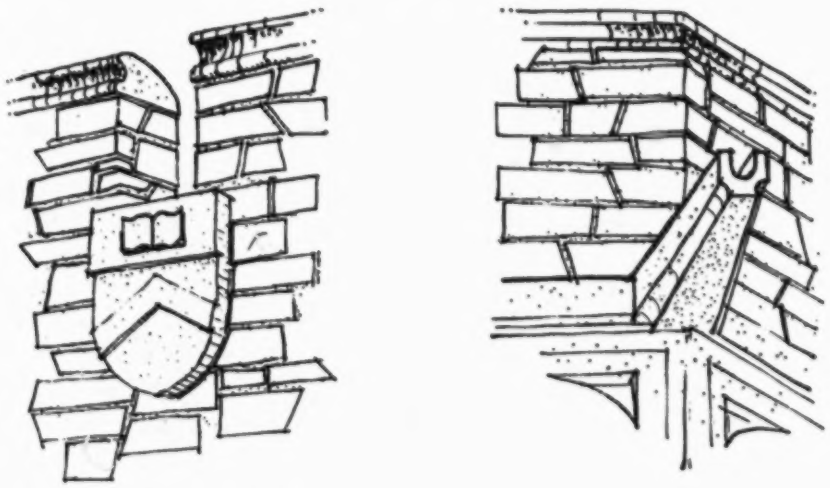
SEVERITY Has Replaced Richness



SUNSCREEN GRILLE



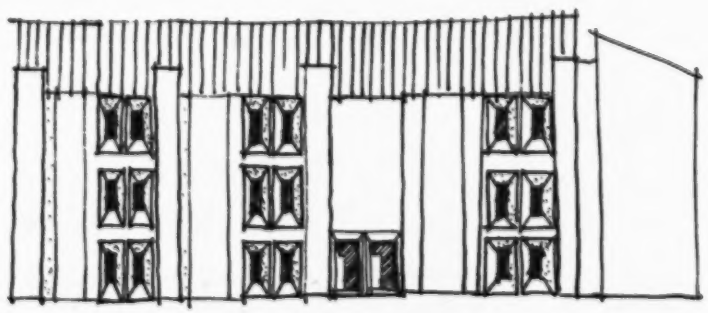
UNDERCUT ORNAMENT



GOTHIC ORNAMENT

For instance, instead of undercut moldings, the creation of voids between materials in the form of reveals reinforces and clarifies the planes of contemporary architecture. This decoration is an integral part of the design occurring at places where there is a change of materials, a change of direction or the meeting of the building with the ground.

Enrichment of Essential Elements



Recommendations. The richness, or decoration of future buildings should be an extension of the Gothic tradition of enrichment of essential elements. This can be done through emphasis on decorative treatment of structure, joinery, shadows and textures. The size and texture of masonry units or exposed aggregate, treatment of window framing and door hardware, the design of water drainage features, can all be handled in ways that enrich without ostentation or artificality.

VARIETY AND UNITY

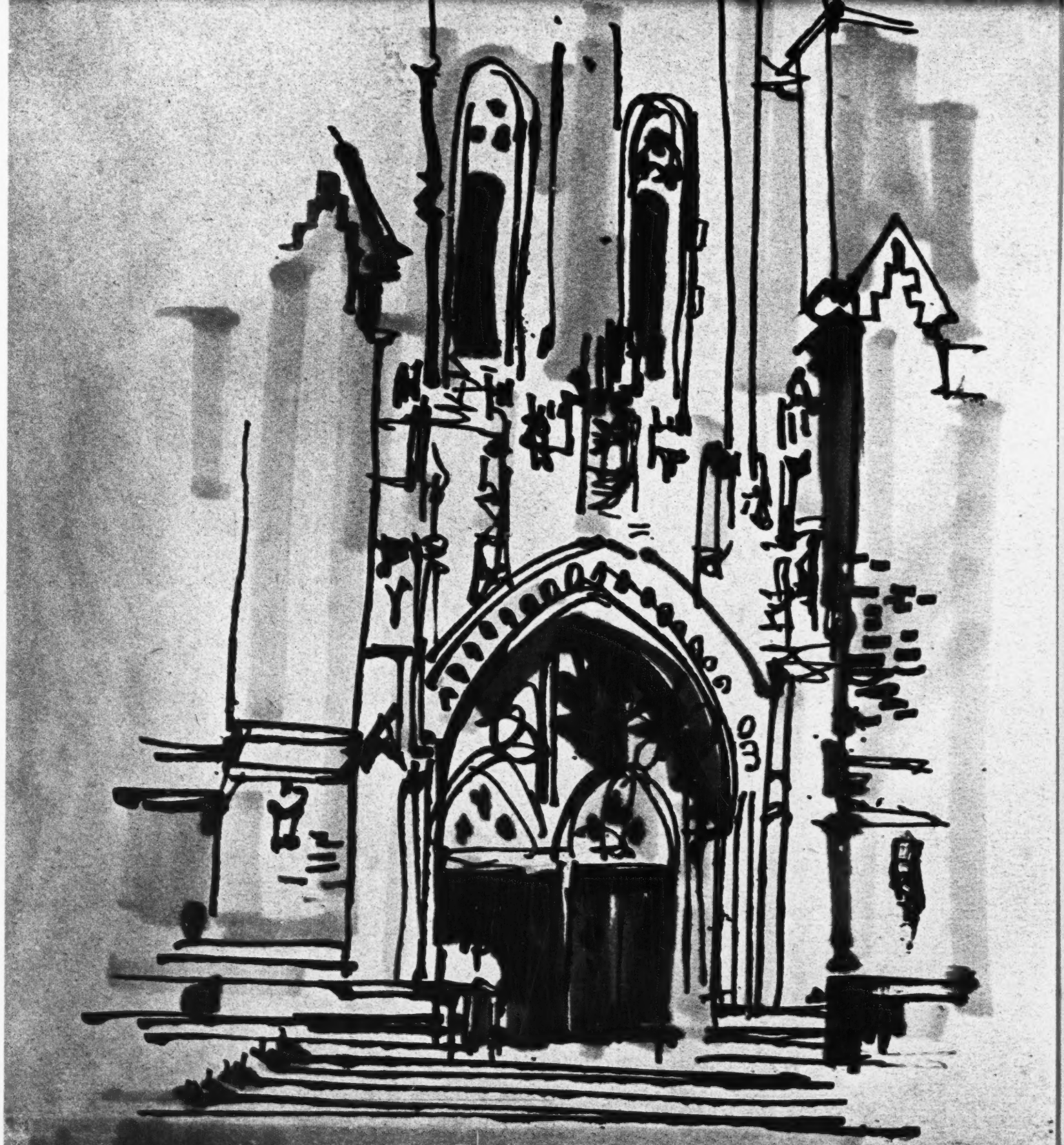
The more extensive the analysis of Duke architecture became, the more variety was revealed. Within the framework of unity established by the basic materials and Gothic style, a close inspection uncovers an amazing variety of building heights, plan arrangements, roof types, window and door sizes and types, and a wealth of ornamental features. This variety is closely related to the richness and human scale of the architecture. It is further emphasized in certain views of the jagged silhouette of the Duke skyline.

JAGGED SILHOUETTE

Recommendations. With modern technology there will tend to be less variety in window and door types, and more uniformity in construction. The rugged informality of most future building sites will tend to offset this. Every opportunity should be taken to recall the variety of the Gothic buildings, in plan arrangements and window groupings, in building heights and silhouettes, varied structural bays and in the expression of the varied functions being carried on within. This variety must be captured in the outdoor spaces formed as well as in the buildings themselves.

In apparent contrast to variety a strong tradition of visual unity must be continued. Perhaps the fact that the variety is a consistent feature actually reinforces the unity. Other unifying features will be in the use of materials, the vertical expression, consistent human scale and structural expression, and in the careful design of outdoor spaces and vistas which weave a thread of continuity throughout the campus.

COMPONENTS



COMPONENTS

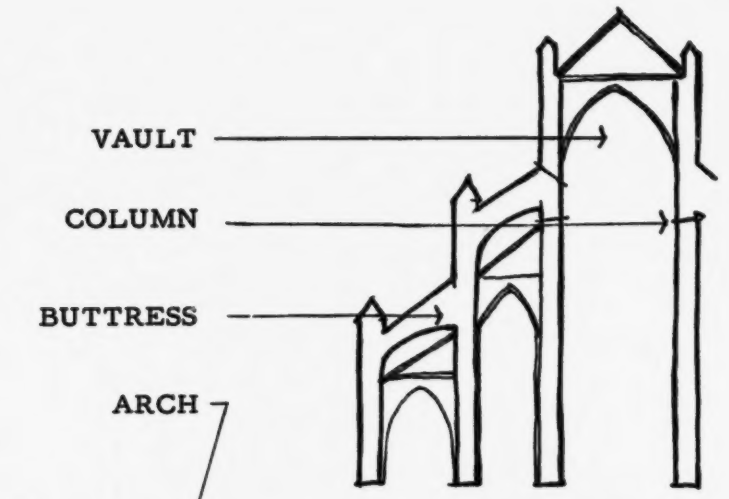
The various building components are the "vocabulary" with which the desired character must be structured. In a like sense the buildings themselves are the components of the total spatial definition. The choice of most of the building components must rest with the individual architects and Building Committee who must design buildings to solve certain problems. However, certain of the components will have the most to do with the external appearance of the buildings, and these should be chosen with two important considerations in mind: (1) To solve the program requirements of the particular building, and, (2) To bring the building into focus as a harmonious element of the total campus environment. We hope that the following suggestions will encompass sufficient flexibility to offer an appropriate answer to both requirements, and will allow the architects to be creative in both the functional and aesthetic phases of planning.

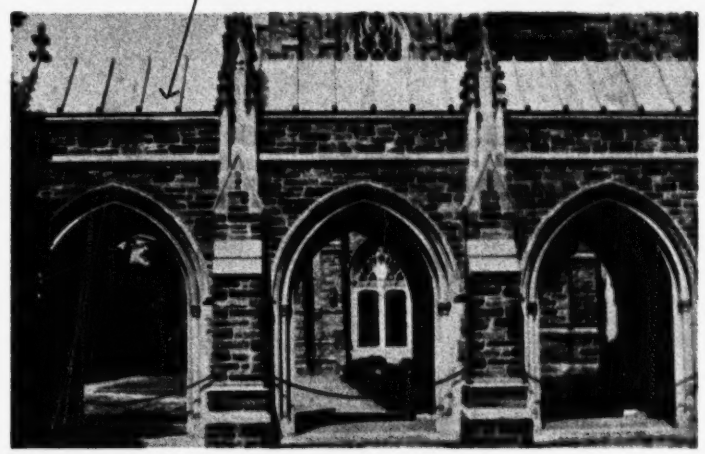
STRUCTURE

The basis of Gothic architecture was structural innovation and the buildings expressed their structural elements visually, rather than covering them up. The basic structural elements were the pointed arch and ribbed vaults, with the arch loads carried to the ground by columns and various types of buttresses. These buttresses were often weighted down by pinnacles to enable them to absorb even greater thrust. The buttresses usually projected out from the exterior wall surfaces and cast shadows on the walls which further heightened the vertical effect. The capitals and columns were shaped by the form of the ribbed arches resting on them. The system was basically skeleton construction as we know it today, with non-load bearing walls and windows filling in between the structural elements.

Many of the original Duke buildings and especially the chapel bring forth the structural expression in true Gothic form, but some of the stone buildings fail to express their structure consistently. This may be due in part to the blending qualities of the stone, which covers column and wall alike, and in part because of the use of small windows in many walls, which give them a massive, structural appearance. Even where buttresses project from the walls they often convey the appearance that they were applied rather than inherent structure. The use of contrasting white limestone on the arches has captured the structural quality of this form, but in many cases the expression of vertical support is lost.

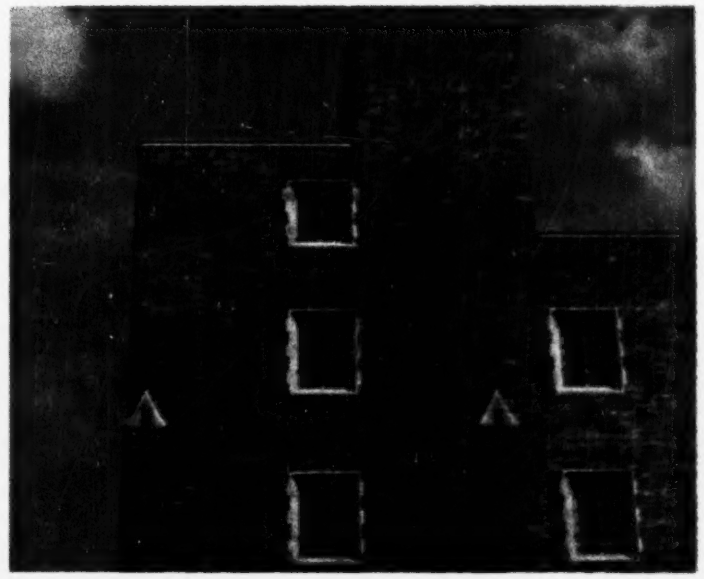
Recommendations. In any continuation of the Gothic style the structure, and especially the vertical elements or columns, must be consistently and emphatically expressed. One or more of the following techniques may be employed, depending on individual building requirements:

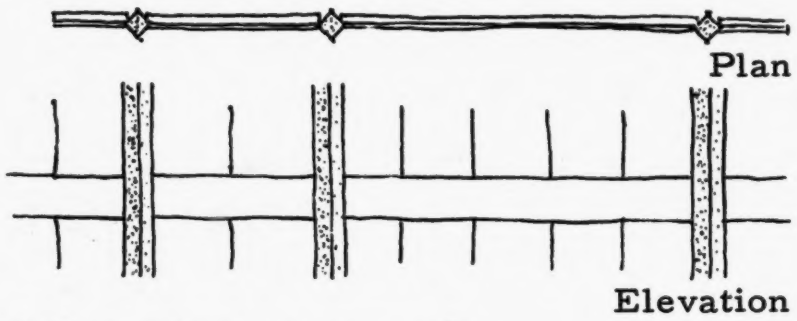




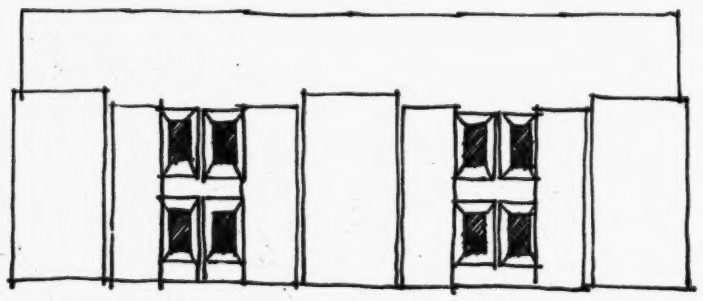
INHERENT STRUCTURE

UNDEFINED STRUCTURE

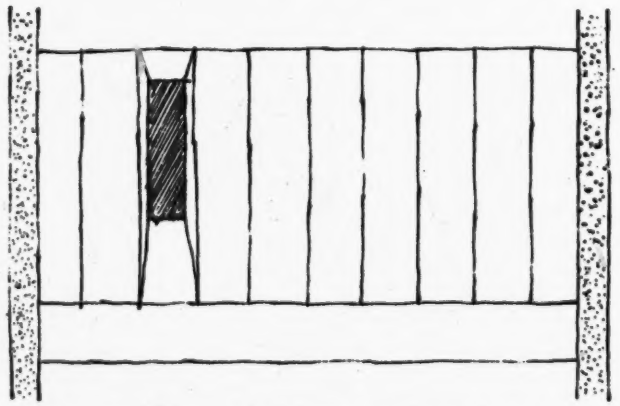




COLUMNS TURNED 45°



VARIED STRUCTURAL BAYS



COLUMNS AND WALLS OF DIFFERENT MATERIALS

1. Columns might be turned 45 degrees to the wall plane and projected one-half of their width to the exterior of the wall to recall the quality of small columns bundled together.

2. Where plan consideration allow, two structural bays of different dimension could be established and repeated to accommodate different interior space requirements (i.e., bedrooms and bathrooms), thus adding variety of functional expression and verticality to the exterior.

3. The material used for columns could be different from that used for the wall planes between columns. This would give both structural and vertical emphasis, but it should be pointed out that this would be a departure from the existing expression (at least on the exterior) and would not relate as closely to existing buildings.

4. Columns (even if structural steel columns are required) could be clad in masonry covers. Such covering would be required for fireproofing and should be expressed as a separate entity for integrity.

5. The arch form, so inherent to Gothic structure, could be recalled through modern technology in precast stone or even in other materials, as a functional method of spanning window and door openings, or as a roof structure. This would be especially applicable at arcades or connections between building units.

MATERIALS

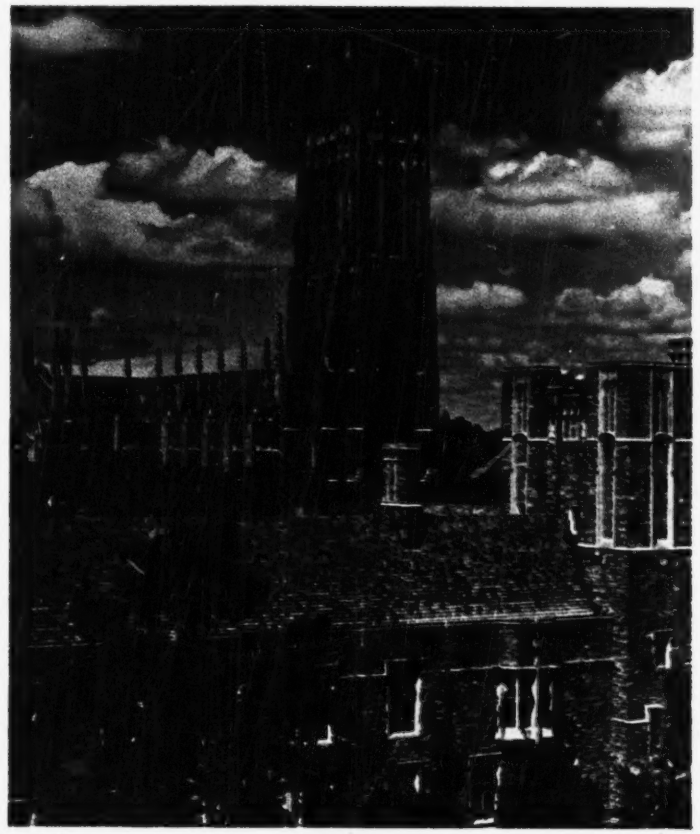
The thoughtful organization of spaces and skillful execution of a building design are more important considerations than the choice of materials. The materials chosen can reinforce, rather than determine, the architectural character in modern times when such a variety of materials is available. Even so, the campuses which appear to have the most homogeneous quality are those such as Duke where the same materials have been employed regardless of style changes. Consistent use of a material with a strong visual impact provides a unifying force and in some instances implies a continuity of style which doesn't really exist.

The terrain of the campus dictates a physical separation of future additions and calls for unity within these new groups as well as consideration for the essence of the style already begun. The stone from Duke's quarry would be one material that could be continued to insure harmony of the old with the new, but new ways of using the stone should be investigated to take advantage of advances in building technology. Other materials which are strong determinants of the Duke campus character are the white limestone trim, the dark windows and the slate walks.

Recommendations. Modern methods should be utilized to achieve unity through the use of the basic materials already in use in the Gothic quadrangle.

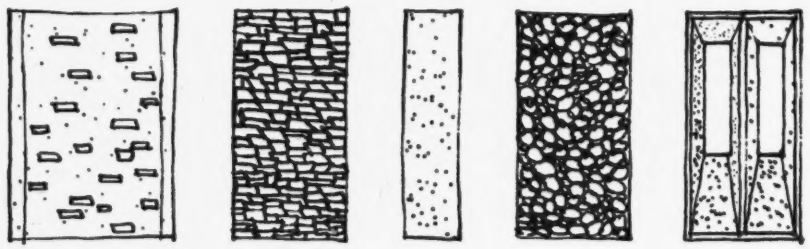
1. The contrasting use of the dark gray Duke stone and the white limestone could be achieved in either of the following ways:

   a. Structure and principal planar elements in Duke stone, with window frames and non-bearing panel walls in light limestone.
   b. Structure in light stone, panel walls and other non-bearing surfaces in Duke stone.

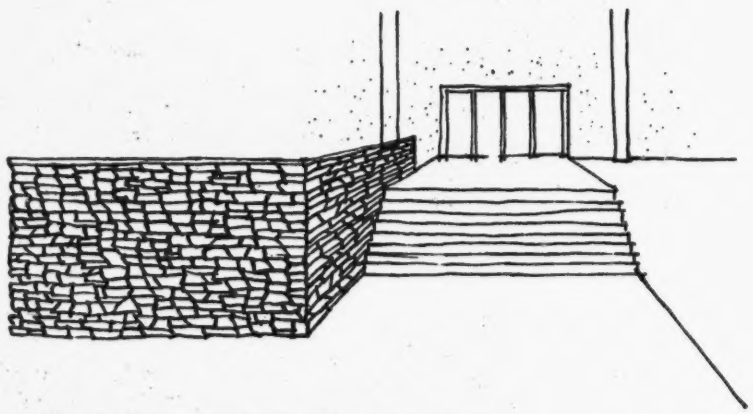


UNITY OF MATERIALS

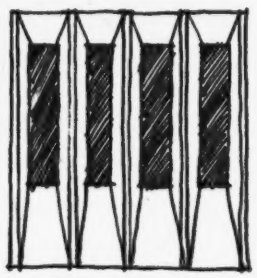
SLATE WALKS



DUKE STONE PANELS



LAID UP DUKE STONE



DARK WINDOWS

Either combination might be valid, but should not be mixed in the same building group.

2. The Duke stone should be a principal element of all future architecture; however, modern technology will provide many more economical applications than the past methods of laying up by hand. Among these we recommend panels of the crushed or cut stone precast in concrete panels. These could employ a variety of aggregate sizes and patterns, panel sizes and cast joinery details. Other techniques of poured-in-place concrete with exposed stone aggregate could also be investigated.

3. A technique which could be employed to recall the existing use of the Duke stone would be to use a large (6 to 8 in.) aggregate in precast wall panels, and a small (1 to 2 in.) aggregate in panels to be used to clad the columns.

4. A variety of light or dark colored precast elements could be mass produced for window and door openings.

5. The Duke stone could be used in the present laid-up manner for retaining walls and building walls where budget permits.

6. The use of slate walks must be continued to and within new building groups. This is a delightful unifying element.

Future pitched roofs must utilize standing seam metal covering or gray tile as used on existing roofs.

Dark gray glare reducing glass should be used in all windows (with the exception of those which might receive stained glass or other artistic treatment).

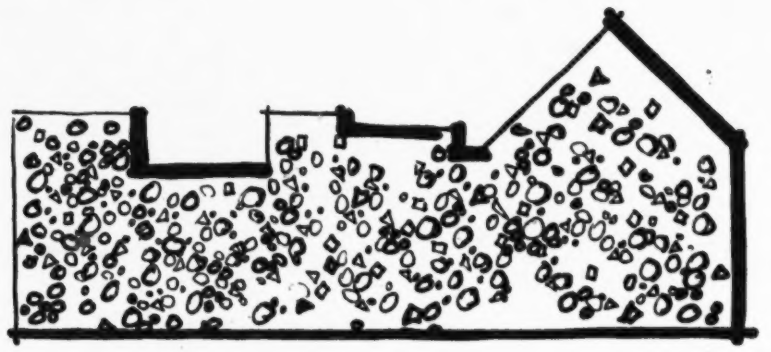
COLOR

The color of the buildings in the Gothic complex has a chameleon-like quality. At close hand, the individual stones are rust red, orange and slate gray and the roofs are mottled shades of gray-blue tile. This overall effect is one of brilliant color. From a distance, even a short distance within the quadrangle, these colors fuse into a warm, somber gray -- a gray that blends harmoniously with the tree trunks and green foilage. This apparent illusion is a demonstration of the pointillist theory of painting with dots of color and allowing the eye to mix the colors into the final hue that is transmitted to the mind. Approaching the campus, one is impressed by the somber dignity of the buildings.

The choice of the strong red brick for the buildings west of the Gothic mall was a disruptive one, especially with their contrasting white columns and panels. The sharp contrast is incompatible with the blending quality of the stone architecture. It creates an impression more appropriate to the formal Georgian architecture of the east campus. At certain points on the campus the red brick buildings and the stone buildings can be seen together, and the discordancy is most obvious.

The appearance of the dark windows is very suitable for the architecture but gray glass would be even more effective since it would eliminate the view of white venetian blinds in windows directly lit by sunlight. When this occurs, the desired effect of dark openings is destroyed.

Recommendations. All new buildings should respect the warm, dignified gray quality of the existing stone buildings. The contrasting and minor light stone should be used in similar proportions. The dark windows should be recalled in glare reducing glass or deep recesses. Contrasting color schemes, such as red or white brick or coloredprefabricated or painted panels must be religiously avoided.

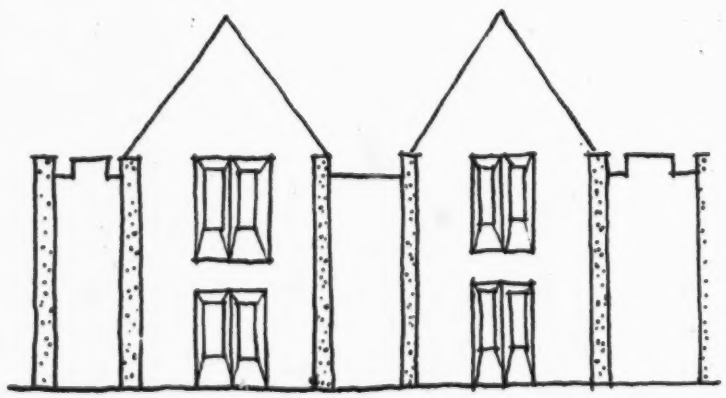


POINTILLIST COLOR

Complementary Colors Mixed
Make a Neutral Color.

DARK WINDOWS

VERTICALLY PROPORTIONED PLANES



Elevation

Plan

PLANAR EMPHASIS

The architecture of Duke expresses a planar emphasis. Looking at the total of the buildings, the details of windows, ornament and materials often become incidents within vertically proportioned planes that define interior and exterior spaces.

These well defined wall panels reinforce the verticality of the architecture, but tend to dilute the structural expression. The exception again is the chapel, where the structural elements project beyond the wall surfaces. In many of the buildings the structure is not prominent and the wall planes, especially gabled ends and towers dominate the view.

In Gothic architecture many wall planes were given to large window areas and recessed back of the principal structural columns and towers, thus reducing their massiveness.

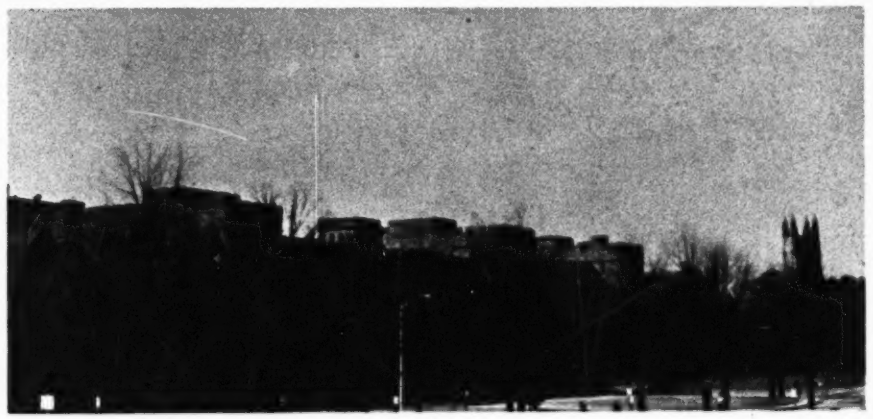
Recommendations. The planar emphasis of existing buildings should be continued, with this important admonition: that care must be taken to visually differentiate between structural and non-load bearing elements. This may be accomplished through a change in materials or texture or a change in plane by projecting the structural columns out beyond the wall plane. Plan should be given vertical proportions wherever possible. Off-sets in plane between various types of rooms or functions will permit a change in plane in elevation and further reinforce this quality.

ROOFS

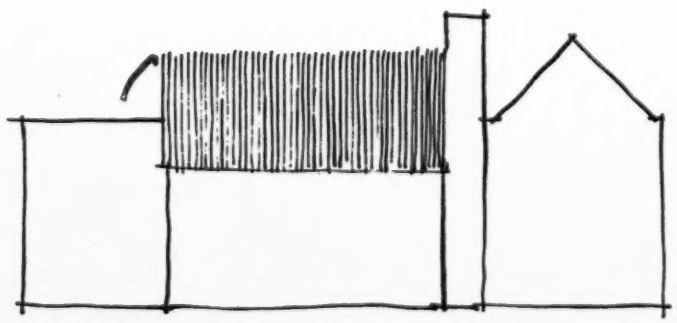
The pitched roofs on many of the Gothic buildings serve two visual purposes. The first is to tie together all the smaller shafts, dormers, and octagonal piers beneath them. Secondly, because of their closeness in color and texture to the walls, they tend to read as a continuation of the wall, giving the buildings an added vertical effect. This roof plane often does not appear pitched and also creates interior space which is difficult to utilize. Another feature of the roof line of Duke is its many-towered profile. The placement of towers at the intersection of buildings and the central tower of the chapel contribute to this. Chimney pots also add to the feeling of a jagged silhouette, which is typical of Gothic architecture. Closely related to the roof line are the crenelated wall tops that contain the roof plane and serve as openings for the downspouts. From many views these "battlements" are a more dominant feature than the roofs. These three principal features of the Duke roofscape; pitched roofs, towers, and battlements, produce an overall impression of variety which is an honest inheritance from Gothic architecture.

Recommendations. Both flat and pitched roofs should be used where appropriate to the building plan and site. A mixture of roof types will reinforce the quality of variety. The jagged silhouette of the Gothic quadrangle should be recalled through the variety of roofs and building heights and through the vertical extension of stair wells and pipe chases in the familiar tower form. Grouping vents where allowed by the plan will permit them to be at least partially enclosed in towers with parapets which provide a visual and functional use. Pitched roofs of metal might logically be used over narrow buildings or units with simple functions and minimum need for exposed mechanical elements, i.e., over classrooms, offices, or dormitory rooms. This might be the most pleasing design where buildings will be built in valleys and often viewed from above.

ROOFS AND WALLS
of similar color and texture



MANY TOWERED PROFILE



VARIETY OF ROOF TYPES

WINDOWS

VARIETY OF WINDOW TYPES AND GROUPS

Windows often have a greater effect on the total character of a building than is consciously realized. Their effect is often subtle, but they may be the factor which leaves the impression that a building is "old-fashioned" or "modern". They can assume a variety of characteristics: they can appear solid or transparent; they can appear as planes or holes, as light or dark, as projections or recesses. A bay of windows may convey the impression of one large window or many small ones. Windows may make a building seem simple and direct, or complex and cluttered.

In Gothic architecture the windows received a wide variety of treatment. The location of windows in the facade was likely to take on a random pattern because their location was determined by the requirements of the plan rather than by visual symmetry as in later Renaissance and Georgian architecture. The windows were also likely to be quite large, filling the entire bay between structural elements. In many of the Duke buildings the treatment of windows reflects more of a Renaissance and even Georgian influence than Gothic. This may have been a conscious attempt to capture some of the character of the old Trinity College on the new campus.

The proportions of Gothic windows, even where grouped in horizontal bays, and the pointed arch over many of them tended to reinforce the spirit of verticality.

Great skill will be required in handling windows in future building design. They must remain a true expression of function and skeleton construction, as in Gothic architecture, and yet not create a breech from the character of the existing stone buildings.

Recommendations.

1. Where possible, windows should be grouped rather than isolated as "punched holes."

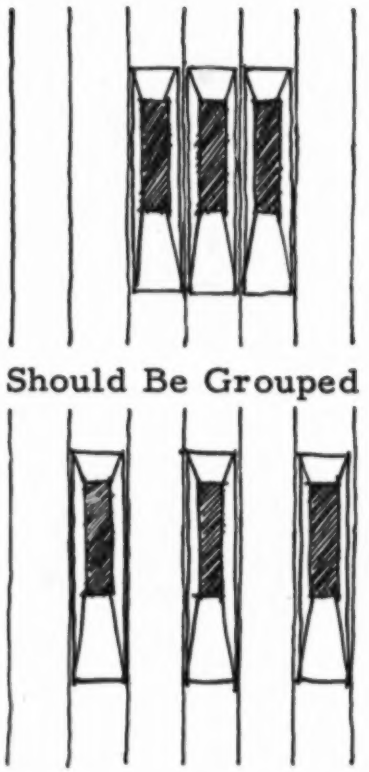
2. Windows should be expressed as vertically proportioned entities no matter what the overall dimension of the window or group.

3. Windows and doors should be recessed wherever possible to recall the deep voids of the existing stone buildings.

4. The variety of room uses or functional requirements should be expressed by the variety of window treatment in the building facade.

5. Dark glare reducing glass should be used to retain the present window character which may be compared to that of the subject to the background of a painting.

It should be noted that windows no longer need to function as a compromise between the requirements of ventilation, light and views. Mechanical ventilation and lighting are superior, and windows can function purely as viewing (and viewed) elements.



Windows Should Be Grouped

Not Isolated

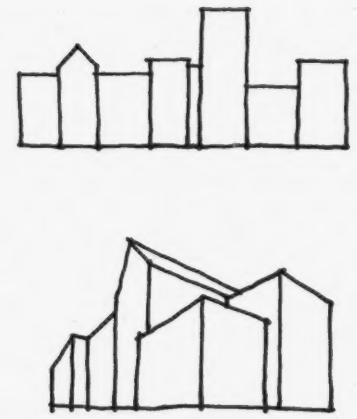
COMPOSITION

COMPOSITION

It is in the composition of the selected components that the skill of the designer will be most severely tested. The techniques which may be required in individual cases are difficult to anticipate, but a review of the principal objectives may be helpful.

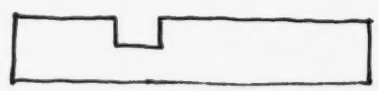
ADDITIVE QUALITY

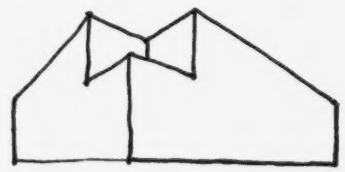
Gothic architecture has a highly developed additive quality which is one of the chief sources of its charm. Buildings and elements of buildings which are complete entities in themselves are attached together in a variety of ways without a rigid formula. This is a reflection of the manner in which Gothic buildings were built up over periods of decades and even centuries before a project was completed. Sometimes arcades join buildings, sometimes a single arch joins them, and sometimes they butt at 90 degrees. Likewise, the various smaller entities such as windows and columns are added, or grouped into the size or quantity needed for the job at hand, rather than merely being a single larger element which has lost its scale.



ADDITIVE

This characteristic is in contrast to some building types in which a volume or cube is implied, from which corners, slots and holes have been subtracted. Some of the newer buildings on the campus, both in stone and brick, tend toward the latter character.





SUBTRACTIVE

Recommendations. The design of each new building or group should be approached as a process of joining together many small components as described above rather than as a process of molding or carving away at a large sculptural object.

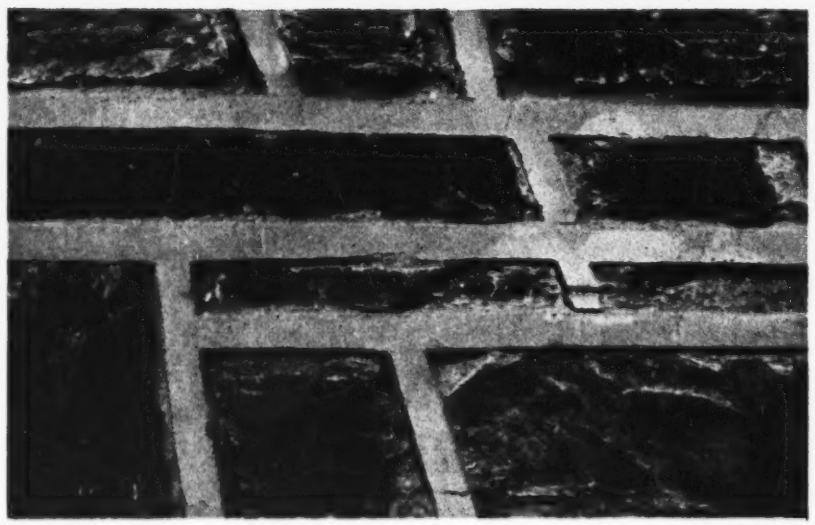
JOINERY

JOINERY OF BUILDINGS

Two catagories of joinery are of interest to this study: the joining of the principal building forms, and the details of connecting materials. The additive composition of building components, and the connection of buildings through arcades and walks, around courts and pleasant open spaces results in a harmonious and appealing whole in the Duke quadrangle.

At the detail level, joinery has not been treated with such sensitivity. For example, in some buildings little effort has been made to relate mortar joints in the stone walls to those in adjacent quoins, or window frames. Economic pressures and a decline of hand craftsmanship have resulted in a regression of detail quality in joinery as well as in ornamentation.

One striking quality at Duke is the type of mortar joinery used in the stone walls. The contrast of the white mortar and dark stone, and the unique projection of the mortar beyond the stone give a very distinctive appearance at close range. This and other details of joinery give an effect of "applique technique."



JOINERY OF MATERIALS

Recommendations. Again the objective is to exercise care and sensitivity in the joining of the additive entities composing the architecture, whether it is the joining of two stones or two buildings. Joining techniques should be developed which are suitable for the materials being joined and contribute to the appearance of the whole. A careful study of joints in elevation and section should be made so that the overall pattern can be related and emphasized to enrich the building. Building groups must be carefully arranged and connected in a variety of ways to result in a harmonious whole.

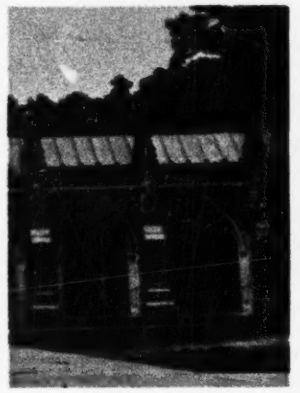
SPACES & VOIDS

The arrangement of buildings shapes outdoor spaces. Furthermore, some building components form voids, or spaces, which appear as a penetration into or through the building mass. These characteristics are an important element of total architectural setting.

At Duke, the arcades joining various buildings around the quadrangle create voids in the enclosure of that outdoor room, which offer an interesting penetration into other spaces. The effect of this great space, very nearly, but never quite contained, has a strong impact and should be recalled in future building groups.

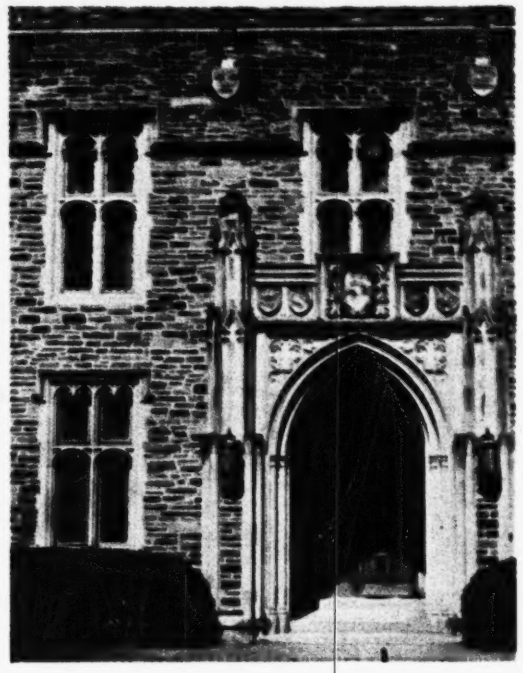
Interestingly enough, the windows in the Duke buildings, by virtue of their dark hue and extensive stone and lead joinery, appear more as solid objects than as voids. Likewise, joints which often can be expressed as voids or reveals, are given the opposite treatment in the Duke buildings, being either raised or flush.

The spaces between buildings may be thought of as three general types: (1) Those occurring where the location of the building was considered first, and the void was generated more or less incidentally. These can be considered as "fortuitous voids", and occur most frequently as small irregular nooks created by the varied plan shapes of the buildings. They often add a pleasant variety and surprise aspect to the environment, and are usually informal and intimate in character. (2) Those designed primarily as spaces or outdoor rooms, in which the buildings serve the space by enclosing it, such as the main quadrangle. These "deliberate voids" may be contained partly by buildings and partly by voids of

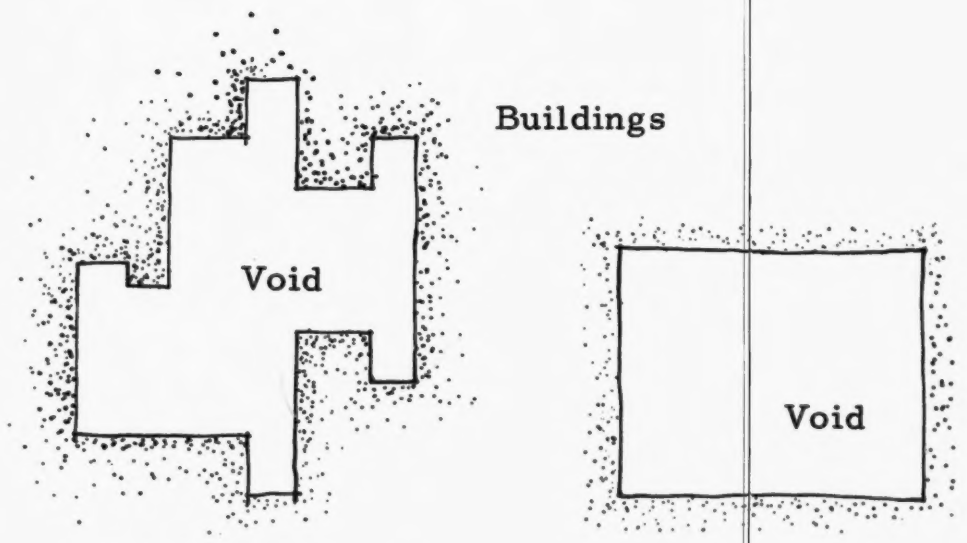


Penetration Through

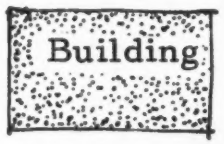
And Into Buildings



VOIDS



PLAN VIEWS 1. 2.



accidental form but still retain their positive spatial definition. Such areas are more formal and monumental in character; though the dormitory courtyards have a very human scale. (3) The third type of outdoor space found on the campus may be thought of as a fortuitous void, but it is opposite in character to the first type described. In this case buildings are dropped into, and disrupt the space as has occurred with the newer red brick buildings.

The monumental scale of the main quadrangle is broken down by trees, sidewalks, chain barriers and other furniture into meaningful spaces of more human scale. There is a startling difference in this space between summer and winter, with the change in foilage. In the winter the volume is overpowering; in the summer, intimate.

Recommendations. One of the most important virtues of the Duke campus is the pleasant combination of spaces forming and formed by the arrangement of buildings in the quadrangle. This characteristic must be captured in new building groups in order to retain the spirit of the Duke campus. At both the detail and building group level a conscious study must be made of the "empty" spaces and voids created, as well as the solid buildings and components being assembled. Voids such as windows must be designed to impart the same dark, solid quality that they do in the existing buildings. All the outdoor spaces formed by buildings must be studied for their formal or informal qualities, and their relation to a human or monumental scale. The outdoor rooms must be carefully woven together to pull the campus into a unified and pleasing whole. The approach must be to attempt to enhance outdoor space with building additions; not to disrupt it, and to enhance buildings with the various voids, reveals, and penetrations; not to clutter or litter them.

TERMINATION

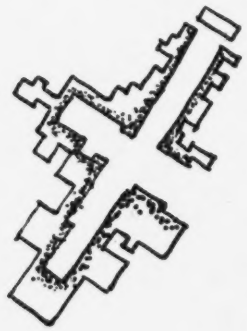
Another important aspect of the total architectural impact is the quality of termination, or the manner in which buildings, components and spaces are ended.

In overall plan the original concept was a quadrangle with a precise edge. Horizontal termination of spaces seems to be inherent. Future growth must then occur in repetitions of building groups with this same quality rather than as extensions added to the existing quadrangle.

The buildings are composed of smaller units which tend to be extruded vertically. Therefore, the main termination problem occurs at grounds and roof, which could be considered as the ends of the vertical composition. At the ground there is little sophisticated ending effect. The ground plane butts the building and the 90 degree change of plane is sufficient to end the building. (This contrasts with buildings which have the first floor facade treated differently, or which are raised on "stilts" above the ground level.) Occasionally effects such as girt courses, arched doorways and enlargement at foundation tend to give additional termination at the bottom.

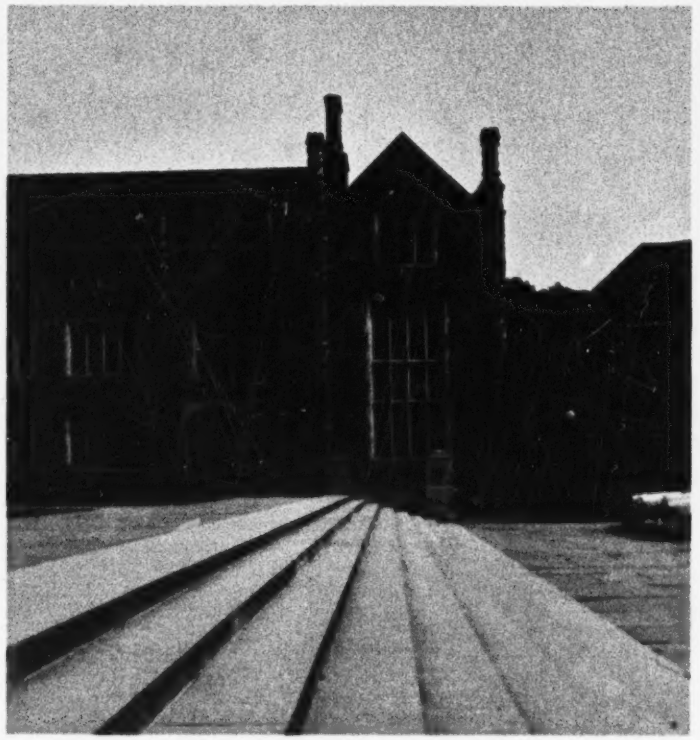
The pitched roofs, with their similarity to the walls in texture and hue, appear more as a whittling away of the mass than as a termination. The crenelated parapets or battlements and tower silhouettes give a definite, if jagged, termination at the tops of the buildings.

The gabled ends which occur so often in the building complex give more of a terminal effect in the horizontal direction



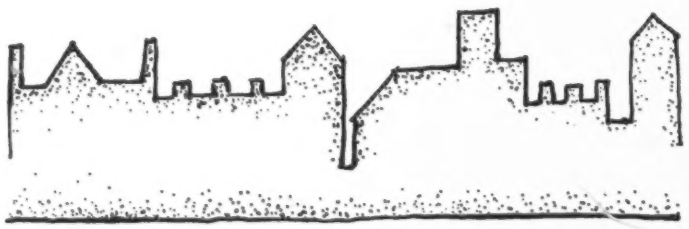
TERMINATION
of Space in Quadrangle

TERMINATION
of Buildings at Ground and Roof



than is actually inherent in the plans of the building. These are, in a sense, a temporary ending; each actually affords a place where a building addition could be attached.

The wall planes are generally not strongly terminated. At most corners they turn with little articulation. At windows and doors there is a change of materials but the two are meshed (quoined) in the same plane.



Buildings Should Have a Solid Meeting With The Ground and a Jagged Meeting With The Sky.

Recommendations. It is important to end a building, material or space thoughtfully. Care must be taken to recall the solid deliberated manner in which the Gothic buildings meet the ground, and the jagged silhouette of their meeting with the sky. Buildings and spaces do not end in a vacuum; they meet other buildings, spaces or objects. This termination must be approached as a form of joinery. Each building elevation must be studied as the end of an outdoor room, and as the meeting of solids and voids, not merely as a facade. The building groups must be arranged to enclose and terminate the principal courts formed, in a way which will recall the combination of precise edge and void penetrations which define the main quadrangle.

PLANS

Plans must be analyzed at two scales: that of building groups and that of individual buildings and their components.

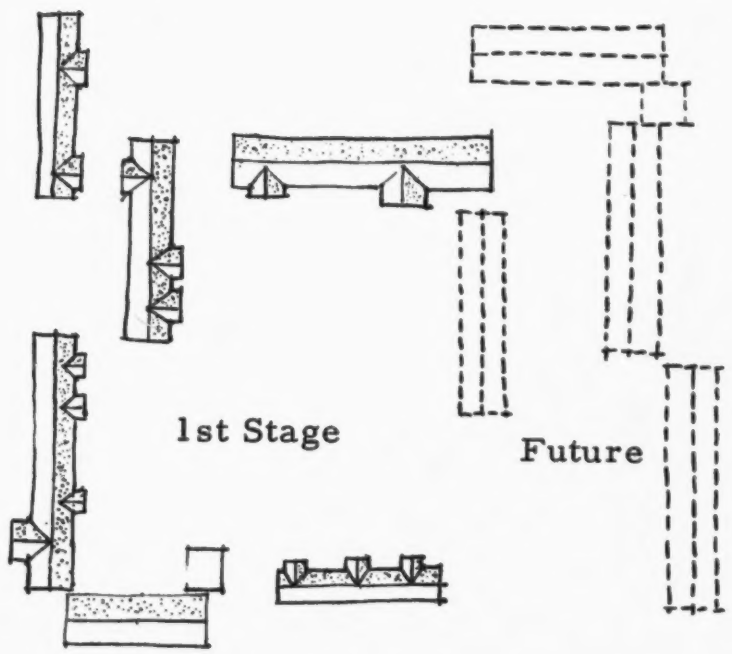
At both scales early Gothic plans were usually the result of functional requirements rather than an attempt to achieve a formal visual effect. In more recent revivals of the style, it was a "function follows form" approach. Thus, when Gothic forms are selected and the functional requirements made subordinate to the visual effect, the approach is not truly Gothic.

The symmetrical axial plan of the Duke campus is related to the later Renaissance building of the 18th and 19th centuries. This formal plan is well suited to the level plateau upon which the buildings are placed. It should be noted that there are few, if any, such level sites elsewhere on the campus. Future building groups must take on a more informal nature as dictated by their site configuration. The price for imitating the original quadrangle would be to strip a site of trees and level it with a bulldozer. Although the great, level quadrangle imparts much of what makes up the Duke character, it must remain unique.

Recommendations. A true Gothic approach to planning would be the most appropriate one for Duke University. It is at the beginning of the process, or in the approach to architectural design that its real character is developed. Such an approach is the only one which can transmit the essence of the Duke tradition to future campus planning and building.

The previous discussion has brought out the main planning considerations, and led us to this compelling conviction:

> No new buildings should be built before the total building group of which they are a part has been planned.



PLAN THE TOTAL GROUP

POTENTIAL BUILDING AREAS

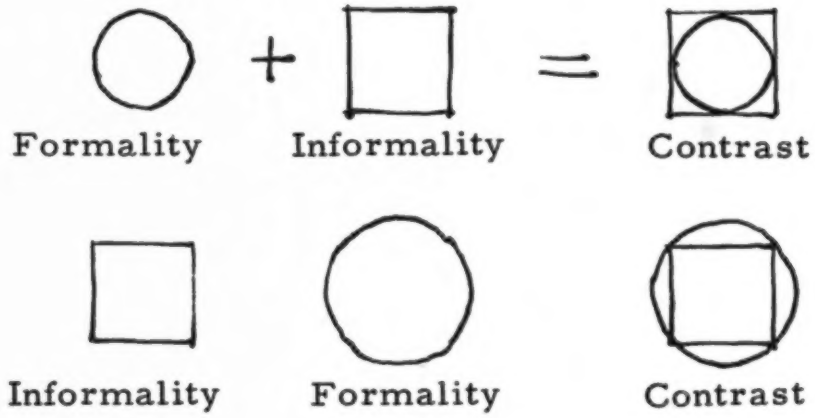
The results of a total planning approach are apparent in the Gothic quadrangle and the woman's college mall. The results of an individual building approach are apparent along Science Drive. The red brick does not make all the difference.

The accompanying sketch map shows five major future building areas. Details of the campus plan may alter these boundaries, but generally speaking these five areas are naturally delineated by topography, streets, or functional considerations. Within each such area detailed planning of the type of use, character of space, and building configuration must precede the commission of any one building project if successful campus environment is to be assured. Such planning is now being accomplished in area #5, the Medical Center. Area #4 presents a special problem because of the buildings already present.

Area #1 has a special significance because of its location at a principal campus entrance. The buildings to be located here must serve a double purpose: they must introduce the visitor to the Duke campus without detracting from or "upstaging" the quadrangle. The buildings should not be diluted imitations of the view to come in the quadrangle; neither should they be "prima donnas" clamoring for attention. The topography of the area may dictate two or even three smaller building groups rather than one, but no wise decisions can be made before the total area is planned.

Within each building group the perimeter buildings should form an enclosing wall. In order to achieve continuity in this wall, the level of the roofs of the buildings forming it should be very carefully studied, especially if a difference of more than one story in height is considered. Matching this consideration to the topography will be a determinant of building location.

The rolling topography of many future building sites will dictate a more informal grouping of buildings, and the spaces formed will be of a more fortuitous nature rather than formal or deliberate as in the quadrangle. As compensation, because of modern technology, the buildings themselves will tend to become more simple and formal. Thus the contrast between these two qualities will be retained, even though reversed in source. The result will achieve more harmony with the existing quadrangle than would a grouping of formal buildings around a formal space, or informal buildings around an informal space. At the same time the new spaces created should link to the old ones and to each other through vistas, voids and the design of the circulation and landscape features.



FOLLOW THROUGH

Thoughtful analyses of past architecture, clever formulas for creating character, pretty sketches of building components, and plausible pep talks urging design quality will mean nothing - absolutely nothing without the proper architectural follow through. We know from experience that the temptation to place expediency over principle and the ever-present tyranny of dollar cost as distinguished from value received can place many pit-falls in the path of proper campus development.

The Board of Trustees must understand and support the broad concepts of the study. The building committee and the University officials involved in each project must understand the recommendations in depth and pursue an active role in their implementation. For this implementation to be successful, the most competent architects, landscape architects, and other design specialists must be employed for each project. One crudely planned building might easily ruin a sensitively designed building group. And here is the key to a successful campus plan. It is the sensitive consideration of space - not just buildings, walks, streets, and parking lots.

When one walks through, sees and feels a beautiful campus, he is aware not so much of the buildings as he is of the walls in the outside rooms, which he finds as he wanders from area to area. Isn't a quadrangle a big outside room? Here space is confined like a room. Only the ceiling is missing. But even here there is a visual definition of a ceiling. The effect of ribbon walks superimposed on the lawns make the walking plane an enormous patterned carpet that helps to give unity to this great outside room.

In the hands of sensitive architects space planning, involving a variety of forms and materials, can be most effective. But unfortunately architects, like all professional people, have varying degrees of talents and experience. A mediocre architect with no concept of space planning nor the ability to handle outside rooms might very well destroy a beautiful and unified campus plan by the construction of one small building complex.

Therefore, we urge the University to choose only the most competent space-conscious architectural designers to execute future building commissions. They can make or break a good campus plan. Impress on them that scholars are sensitive to their environment and that their architectural designs can stimulate or depress. Emphasize to these architects that quite often the stress on mental and physical development is caused by the neglect of social, spiritual, emotional, and aesthetic development of the individual. Say to them that they are not only responsible for the space contained in the building shells, but they are also responsible for what they do to the space surrounding their buildings. Point out too, that the preservation of beautiful vistas and enrichment of natural landscape is their responsibility.

The success of this or any other campus environment largely depends on the competence of the architects who are selected to design the individual buildings. Pick the best ones; they cost no more. Make sure they have the sensitivity of space planning. The good architect will know that space is experienced as well as seen.

The combination of a good campus plan and good architects for individual buildings is of the essence. One without the other won't do.

PART B

CASE STUDY

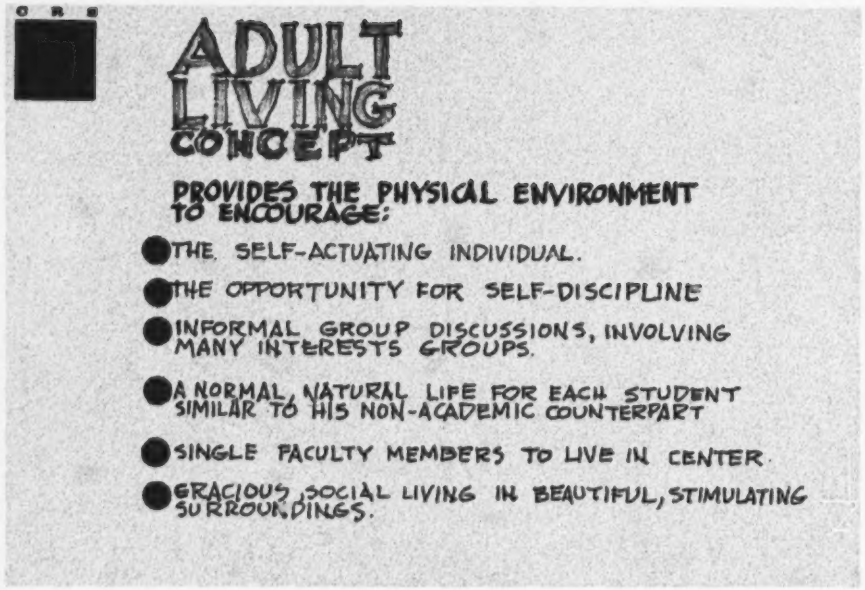
PROPOSED GRADUATE STUDENT CENTER

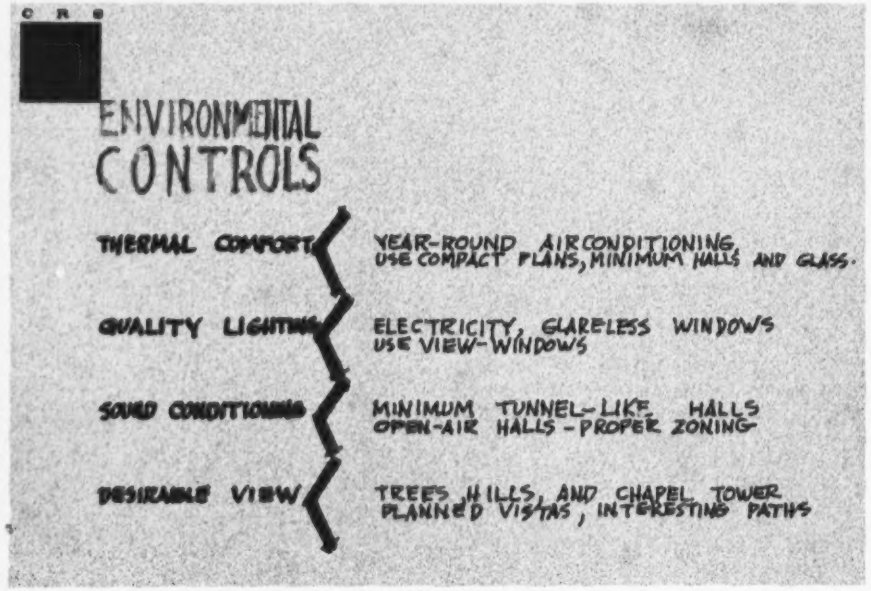
As a logical step in the Design Study it was necessary to test the recommendations on a real building program. From the list of future projects a proposed 600 bed Graduate Student Center was selected. The scope of the project was to complete the schematic design phase, as described under the standard A. I. A. Agreement.

The programming, analysis, and design of the Graduate Center are briefly summarized on the following pages, with emphasis on a critical analysis of the exterior character and site plan. The aspects of program and analysis are explained here only to the extent necessary for an overall comprehension of the project.

A brief explanation of our design method may be in order for those unfamiliar with CRS. In our practice we have found that the best buildings result from a team approach, with the client as an active member of the team. Therefore, after the program is established, a design team goes to the vicinity of the project for a concentrated night and day design session. This on-the-spot design technique at a place convenient to the client and to the site, has acquired the rather undignified nickname of "squatters".

During the squatters the ideas developed are rapidly recorded in rough sketch form on 5 x 8 cards which can be projected as slides for group review and provide a compact, usable record. The graphics on the following pages are half-size reproductions of some of the analysis cards from the Graduate Center squatters. The originals are in color and some details have been lost in the black and white reproduction.





The requirements of the proposed facility, as determined by the Educational Facilities Committee and the Graduate Dormitory Subcommittee, are summarized in the following list of design considerations:

1. Design for adult living -- graduate students are adult, and and if treated as such, will be more likely to respond in a mature manner.
2. Provide single self-contained rooms, conducive to privacy and study.
3. Eliminate monotonous, noisy, double-loaded halls.
4. Provide a complete residential community --living, study, dining, recreation with spaces which encourage informal discussions and conferences.
5. Create variety in dining facilities, living rooms, common areas.
6. Encourage the amenities of gracious living - table service, after dinner tea, music, periodicals, auto entrance to dining and commons.

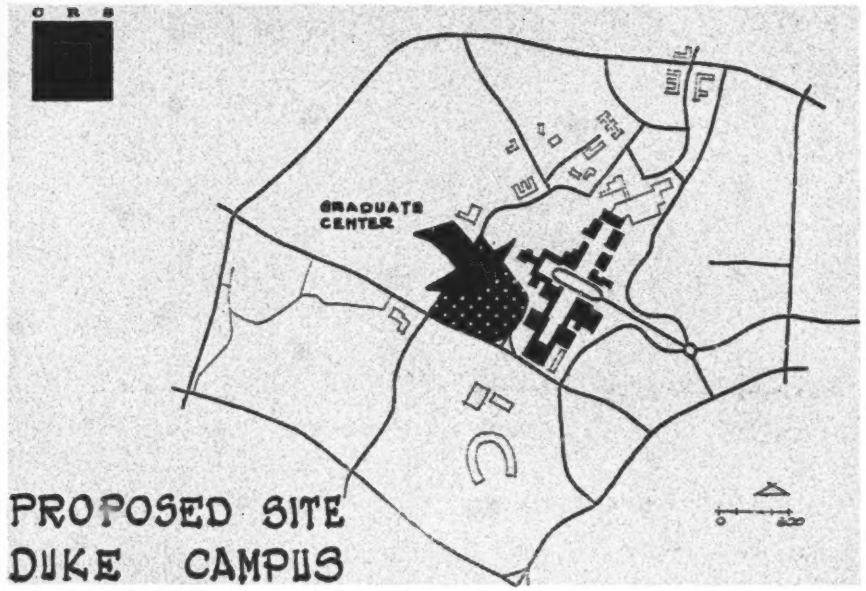
7. Achieve economy through multiple use of spaces and combining of compatible areas.

8. Emphasize sound conditioning to create quiet rooms and alcoves as well as isolation of naturally noisy areas.

9. Provide complete air conditioning -- graduate education is a year-round process.

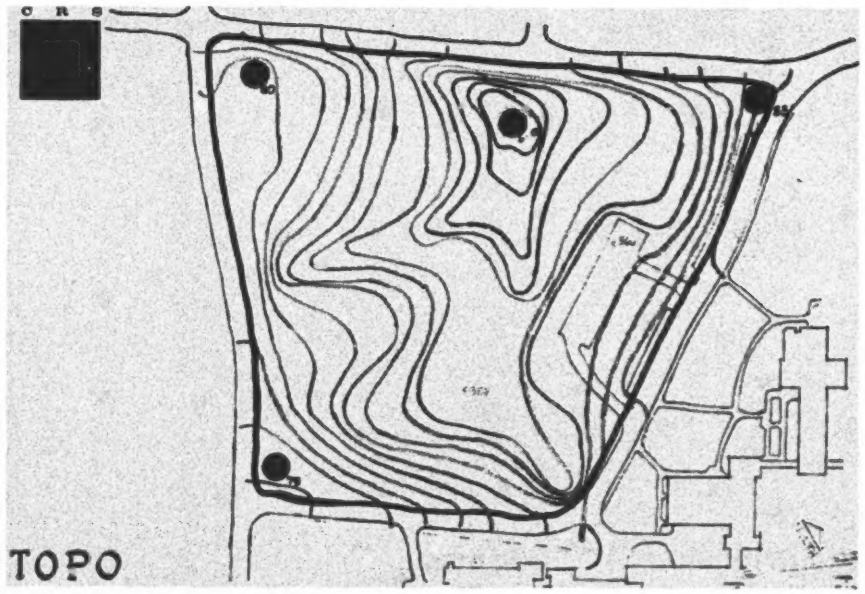
10. Design for outdoor living to take advantage of the beautiful view and desirable climate.

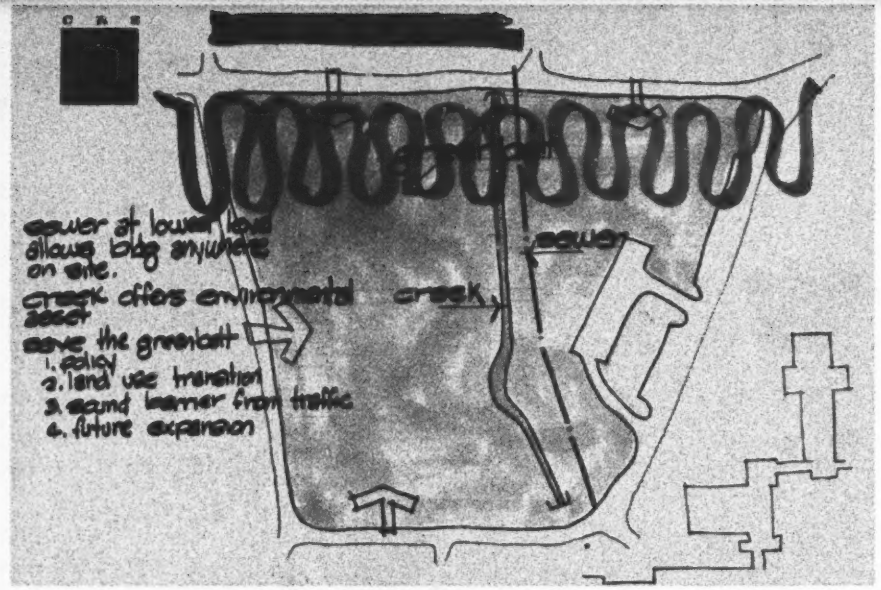
11. Begin with a 500 to 600 bed facility, expandable to twice that size.

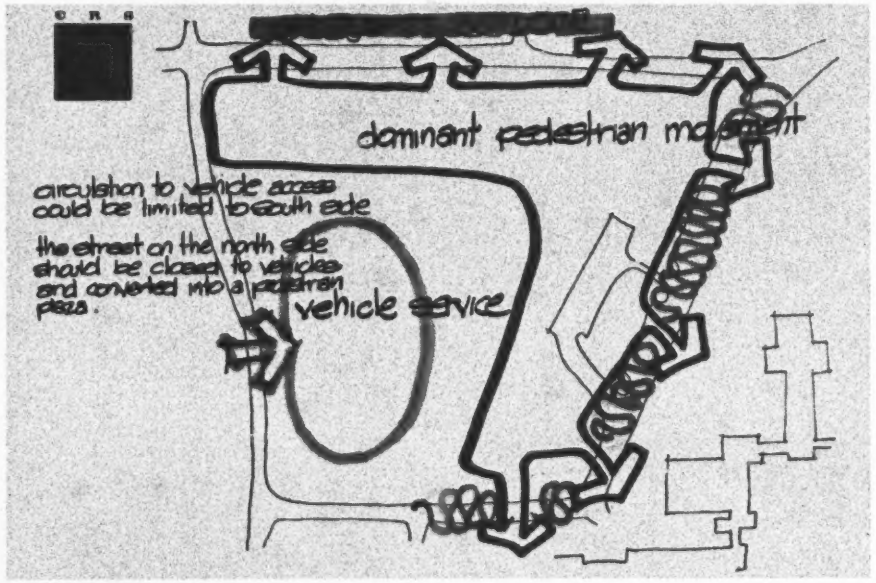


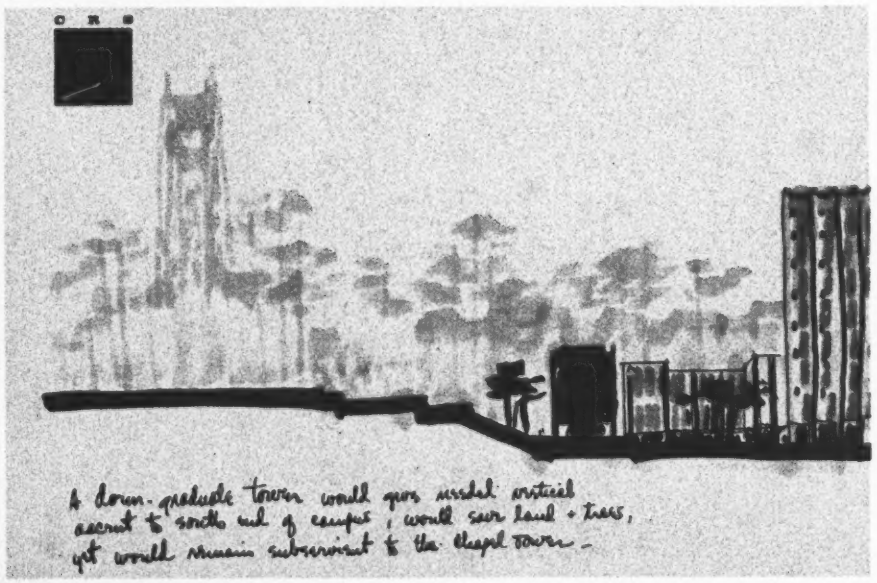
12. Design for maximum use of natural environment and minimum destruction of existing trees and contours.

The site selected is a beautiful, rolling, wooded tract west of the present undergraduate dormitories and south of the Duke Chapel. The site is a valley, or "dish" sloping down from the perimeter to the center. It is heavily wooded.









ANALYSIS

Climate. A thorough investigation of the Durham climate was made prior to the design squatters. This study dealt with temperatures, heating and cooling seasons, clear and cloudy days, precipitation, snow and sleet, sun angles, and wind. All of these factors must be considered in the orientation and design of a building and its mechanical systems.

Site. The site received a great deal of attention, It is a beautiful and challenging portion of the campus. It became apparent that the building complex should be arranged to:

1. Allow a maximum amount of the existing landscape to remain undisturbed.

2. Create outdoor rooms which are intimate in scale, and provide shelter enough to allow maximum outdoor living and circulation.

3. Open a vista to the Chapel Tower.

4. Separate vehicular and pedestrian circulation.

Buildings. The greatest effort was spent on the analysis of plan and exterior design. Part A of this report contains the general aspects of this analysis, which need not be repeated here. The site offers a unique opportunity to utilize tall compact buildings, which save trees and ground area, and yet not compete in height with the Chapel Tower, which is located on higher ground.

DESIGN

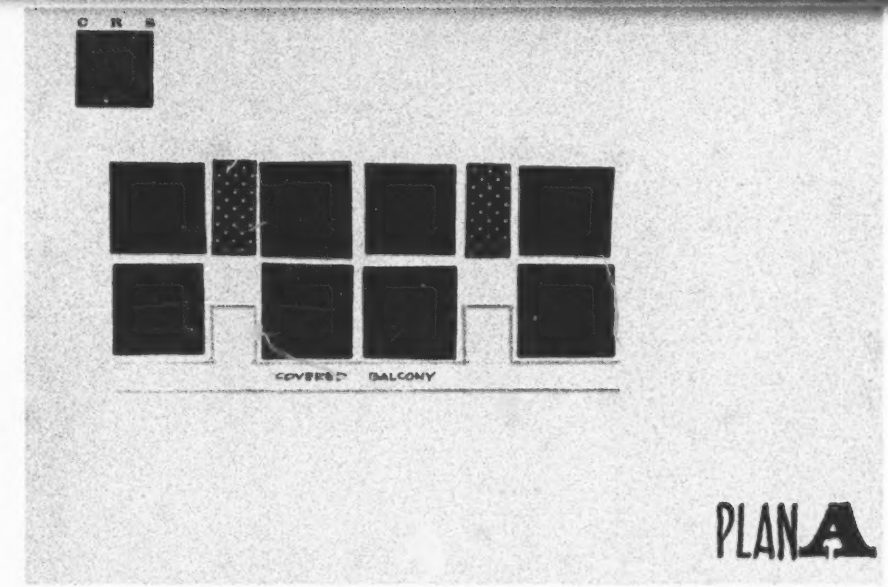
Discussions with the Graduate Dormitory subcommittee repeatedly revolved around the adult living concept, and the disadvantages of double-loaded corridors in existing dormitories. The conclusion was that single rooms and exterior circulation, with a separate outside entrance to each room offered the best answer for both privacy and sound control. This also offered advantages in economy of operation by reducing the area to be air conditioned. One question raised by the committee was that of control, especially for women residents.

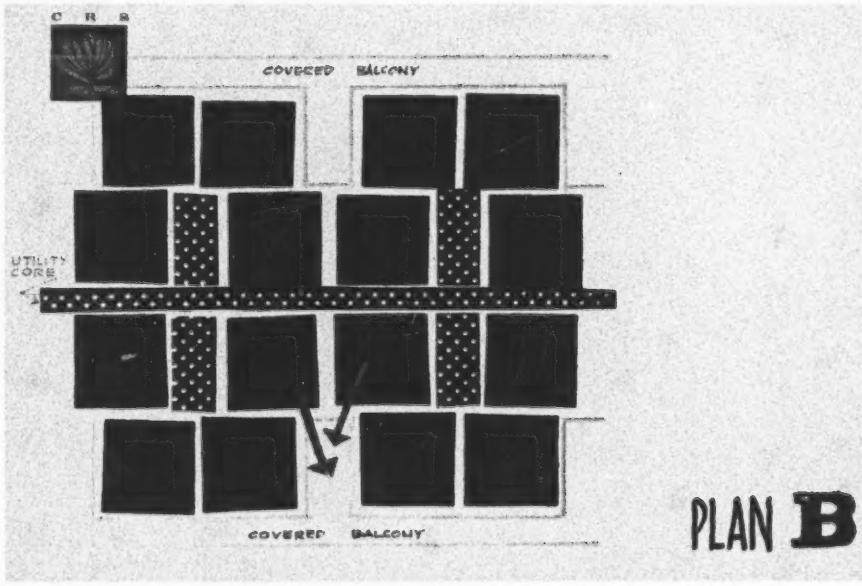
Three basic floor plans were developed. These plans can be added in repetitive units to create buildings of varied length, widths and heights.

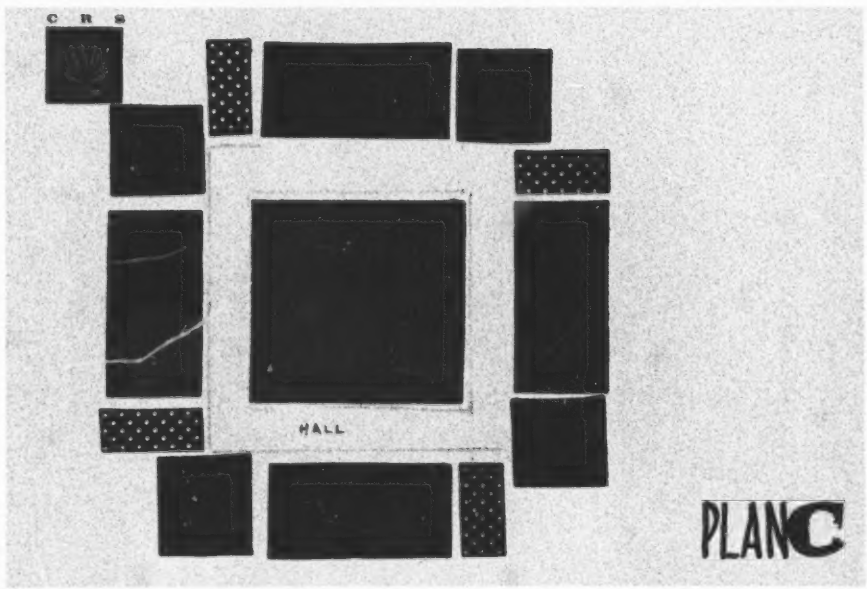
Plan A. This basic unit consists of four single bedrooms sharing one bathroom. Circulation is by an outdoor covered balcony and finger corridors to each four rooms.

Plan B. The basic unit is similar to Plan A, but combined in a different way. Here a wider and more compact building results from adding units on each side of a continuous utility core.

Plan C. This is a different type of plan designed to offer the option of more control. The units are added vertically to form a tower with 10 rooms per floor. Plan C is designed primarily with women students in mind, and contains a housemother's apartment and visitors' lounges on the ground floor. It was also felt that more women would prefer double rooms.

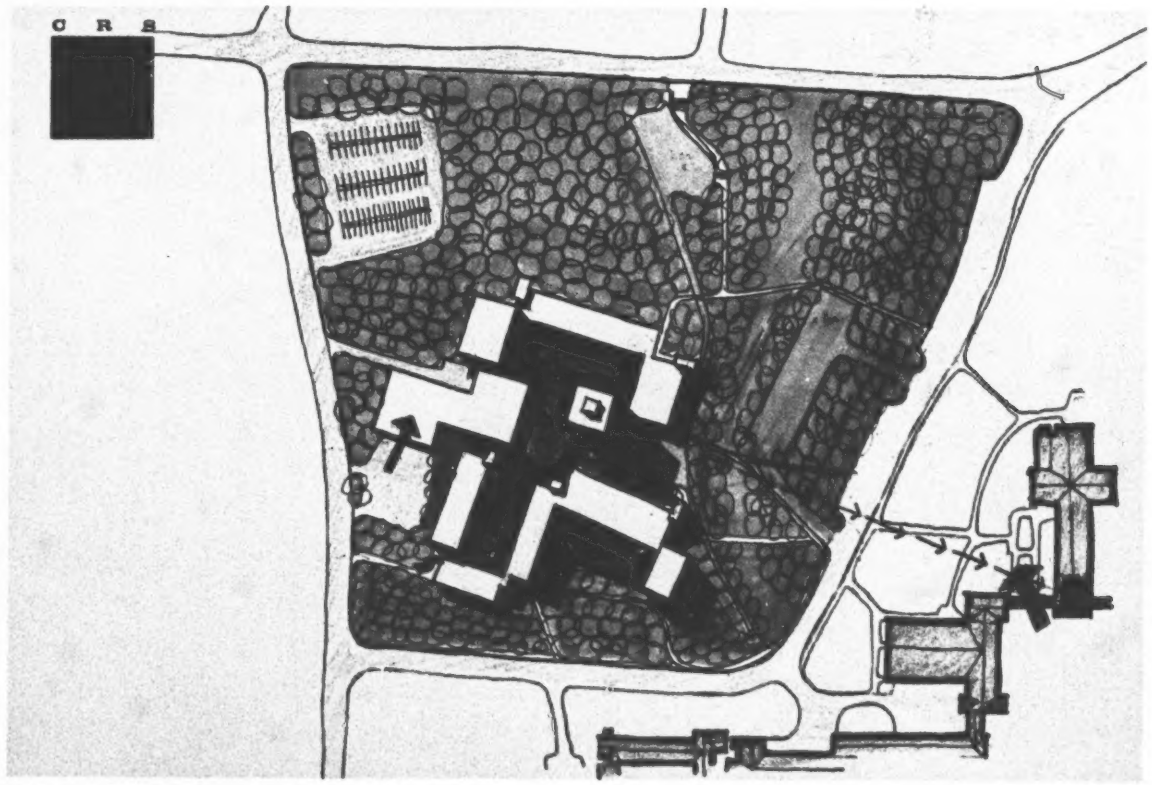


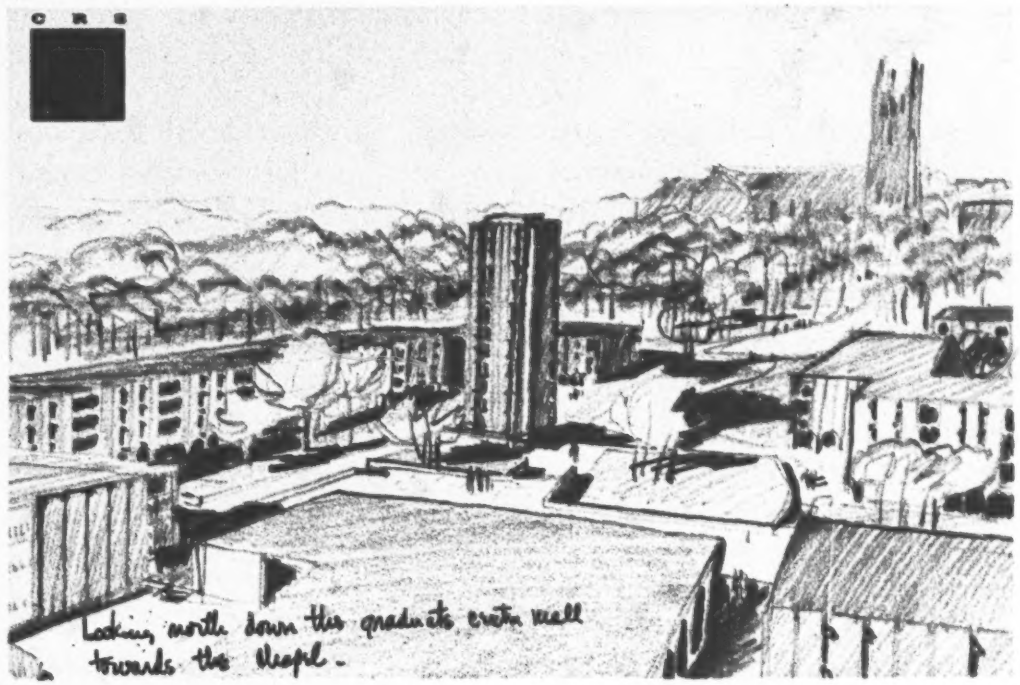


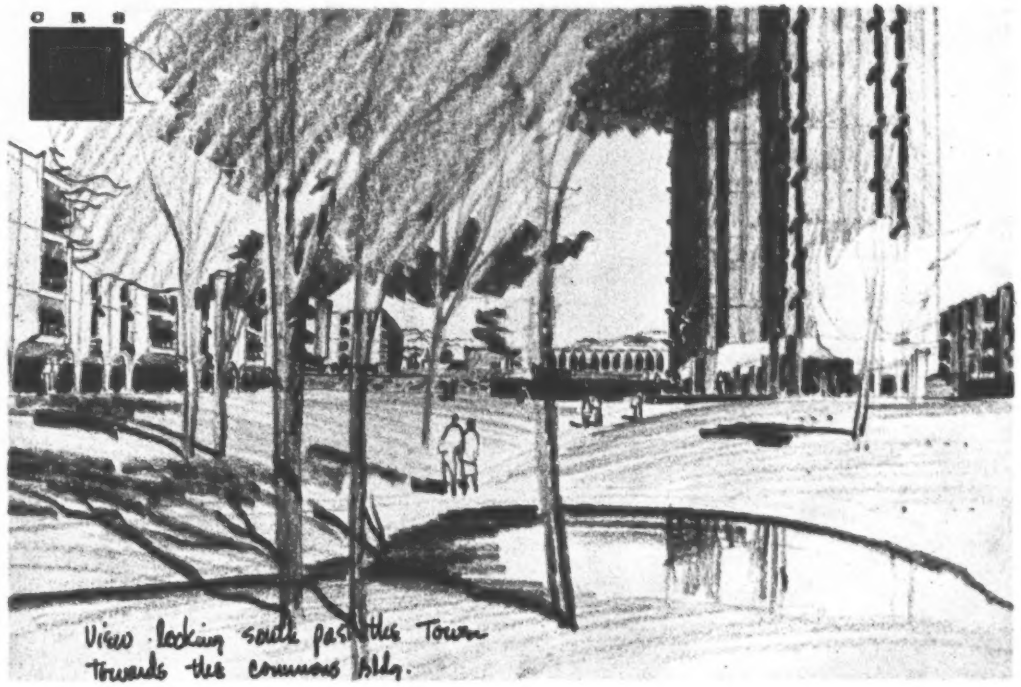


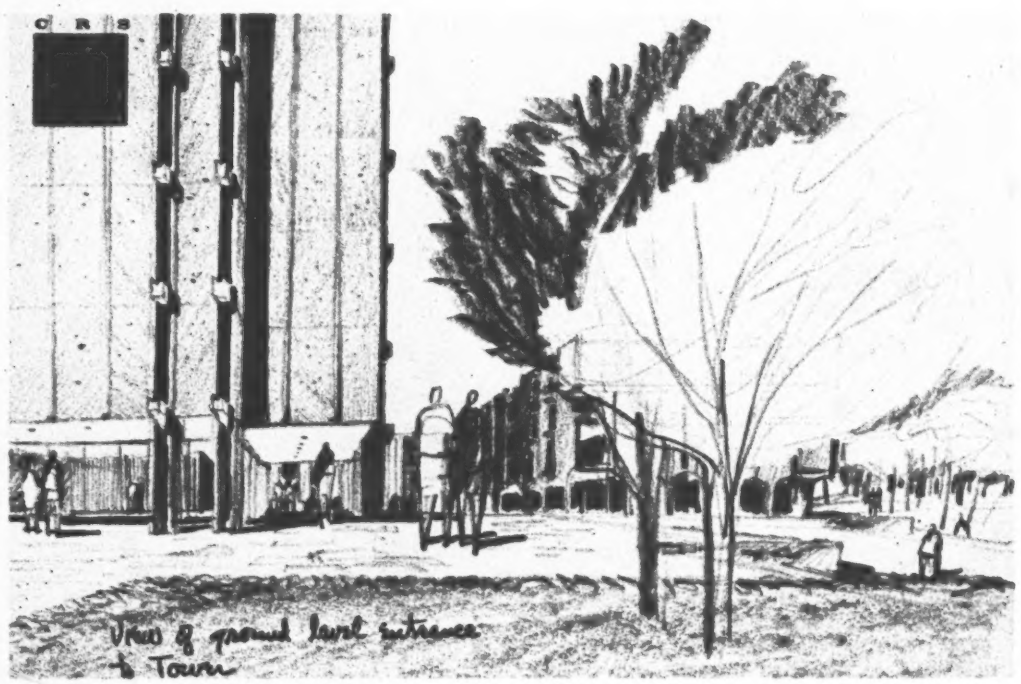
In the plan which was presented for review at the end of the squatters week the buildings containing A and B units were grouped around a tower of C units and a commons building containing dining, lounges and recreation space. This plan was revised somewhat on the basis of a later and more accurate topographic survey, but remained the same in concept.

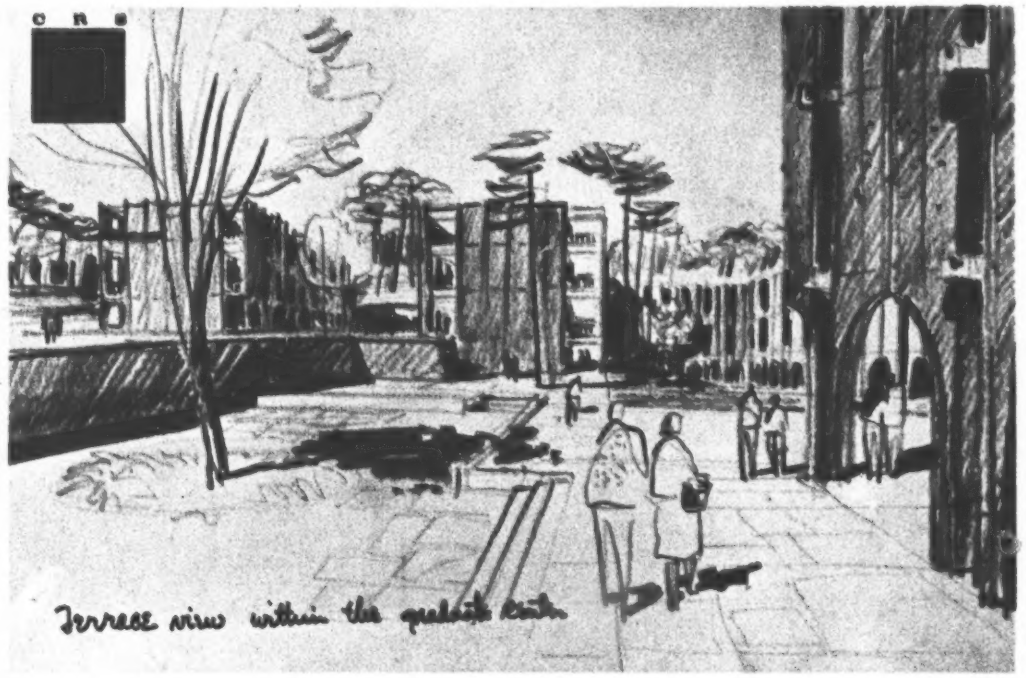
The remaining sketches illustrate the intended character of the Center as presented at the first review. The buildings are constructed with concrete structure and clad in precast panels of Duke stone aggregate. The tower contains 100 beds on eleven floors.




C R S
Looking north down the graduate center mall towards the chapel.


C R S
View looking south past the Tower towards the commons bldg.

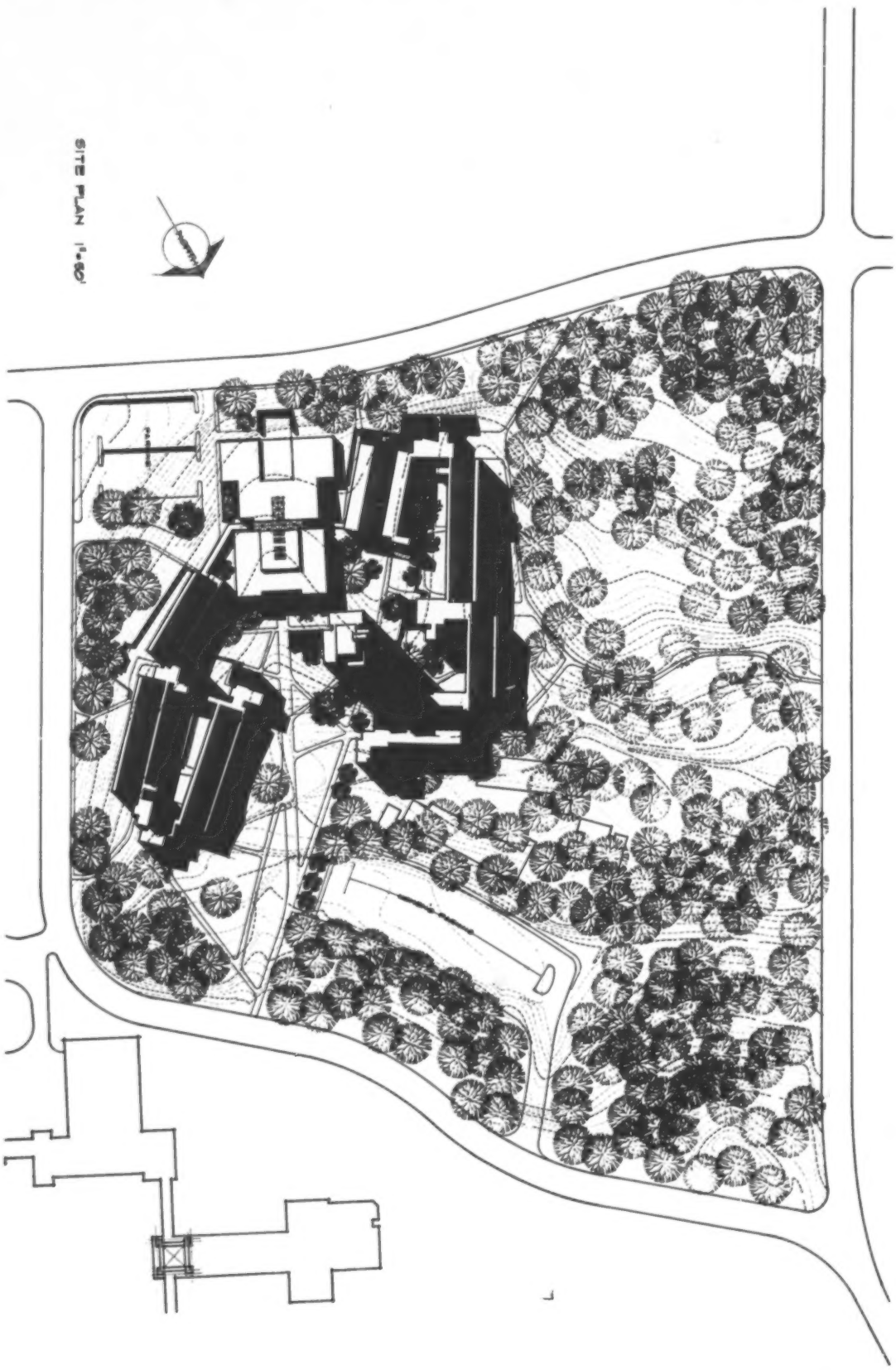

C R S
View of ground level entrance to Tower


C R S
Terrace view within the graduate center

CRITIQUE AND FOLLOW - UP

Upon review by the Building Committee, Educational Facilities Committee, Graduate Dormitory Subcommittee and various university officials, the basic concepts were approved, but there was a general feeling of the Building Committee that the exterior design of the buildings should establish a closer tie with the existing quadrangle, especially in the case of future buildings which might be located more in the "front door" of the campus. The very valid observation was made that the existing Gothic quadrangle exhibited both more variety and more unity than the Graduate Center sketches indicated. Further study was suggested, primarily in the treatment of roofs and windows.

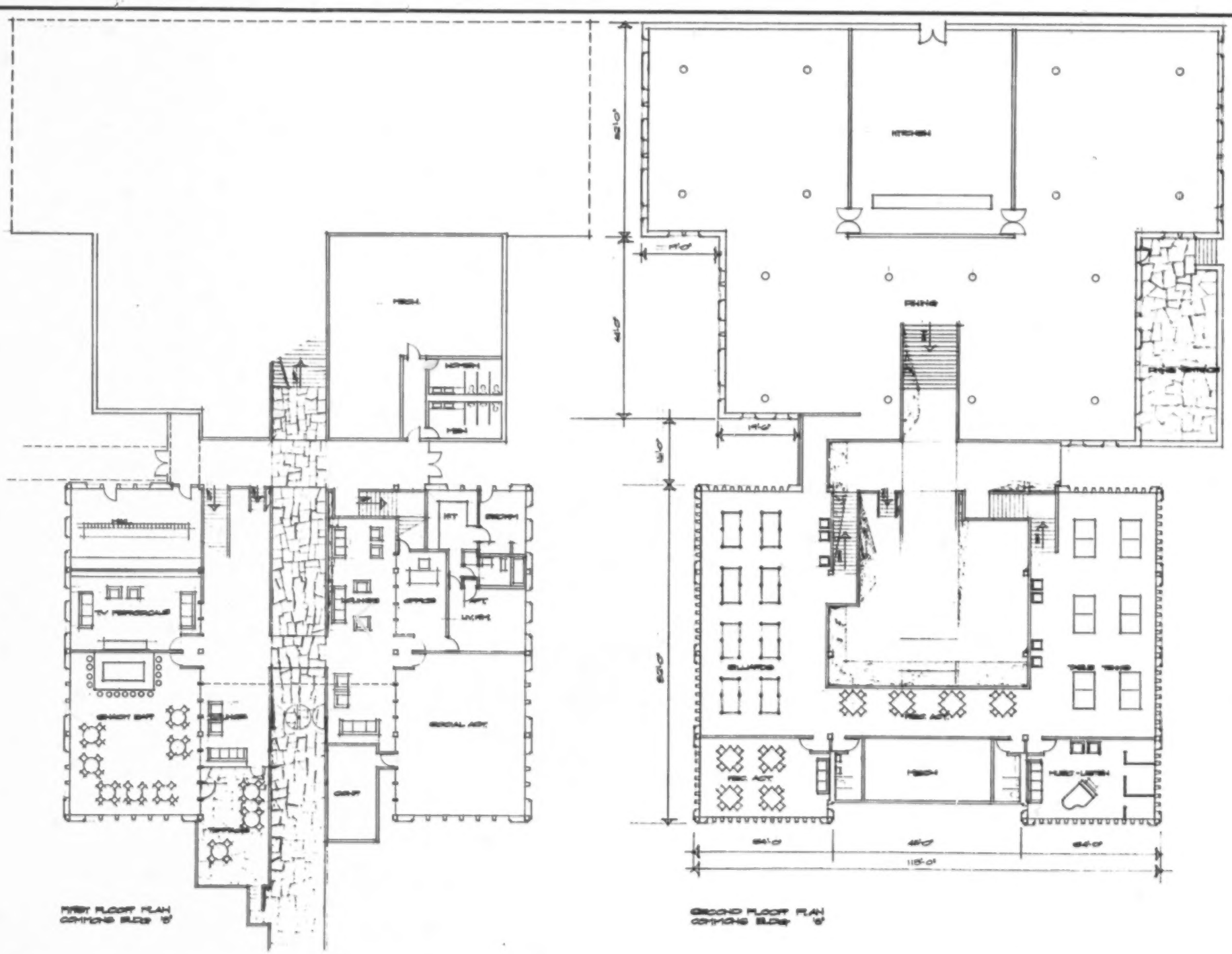
Such a study was made, along with a new site plan based on an accurate topographic survey. The approved schematic design and plans appear on the following pages.



1

CAROLL HOWLETT SCOTT

GRADUATE CENTER
DUKE UNIVERSITY



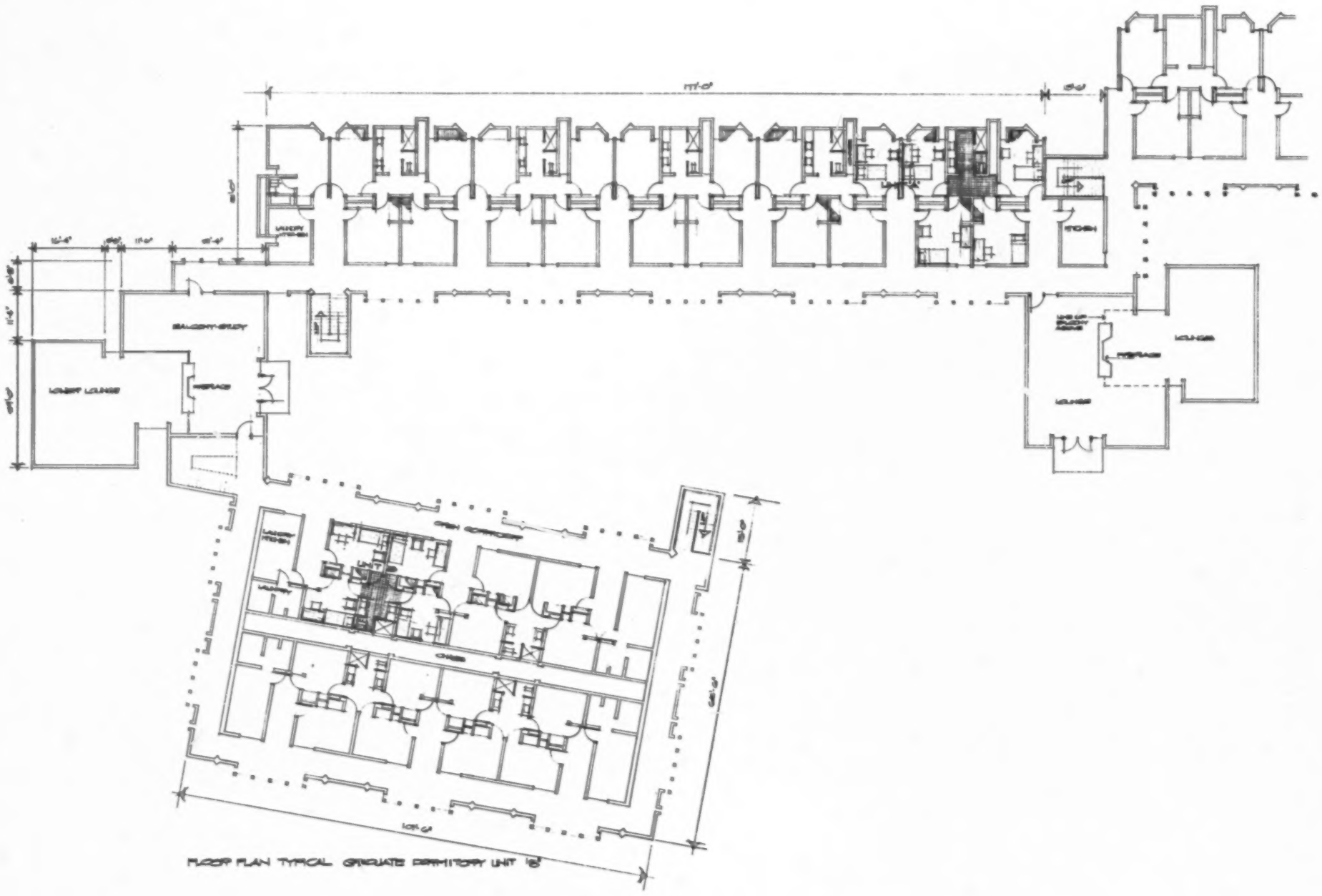
FIRST FLOOR PLAN
COMMONS BLDG "B"

SECOND FLOOR PLAN
COMMONS BLDG "B"

GRADUATE CENTER
DUKE UNIVERSITY

CAUDILL ROWLETT SCOTT
ARCHITECTS PLANNERS CONSULTANTS
TEXAS OKLAHOMA CONNECTICUT

2

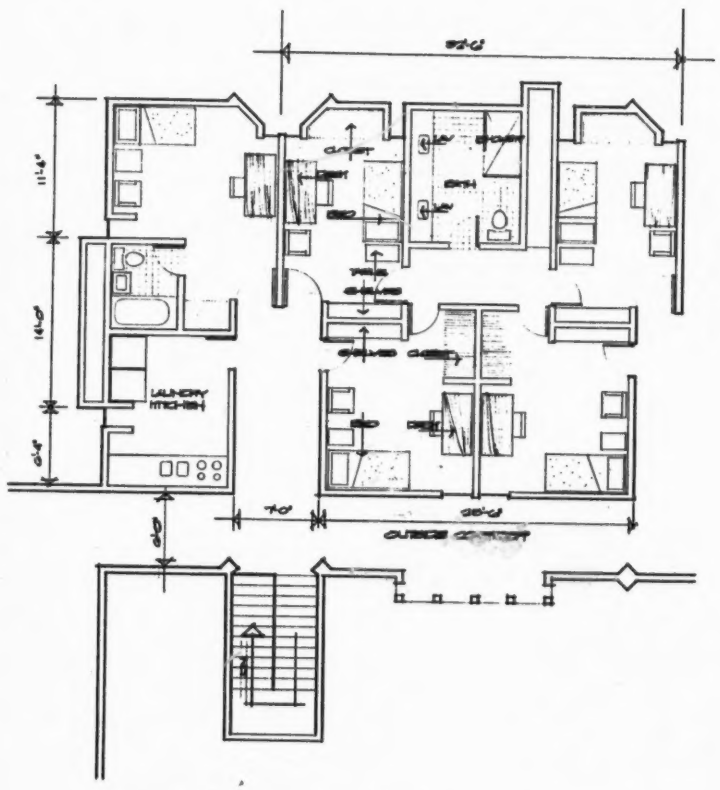


FLOOR PLAN TYPICAL GRADUATE DORMITORY UNIT "B"

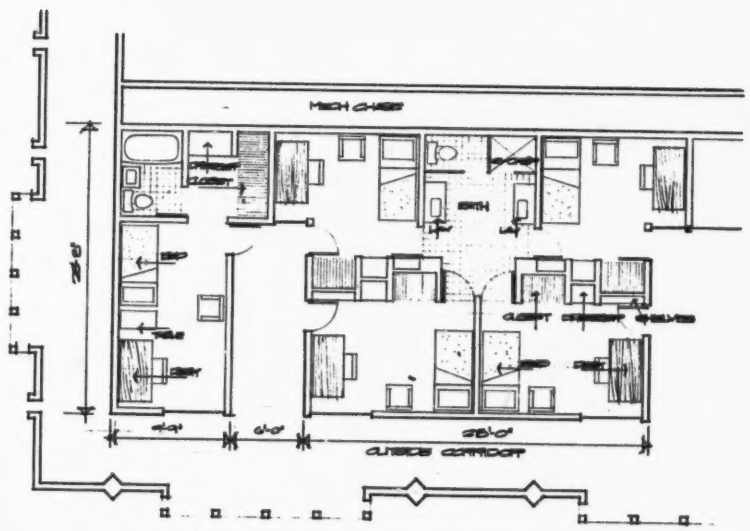
GRADUATE CENTER
DUKE UNIVERSITY

CAUDILL ROWLETT SCOTT
ARCHITECTS PLANNERS ENGINEERS
TEXAS OKLAHOMA CONNECTICUT

3



TYPICAL UNIT 'A' FLOOR PLAN 1/4"

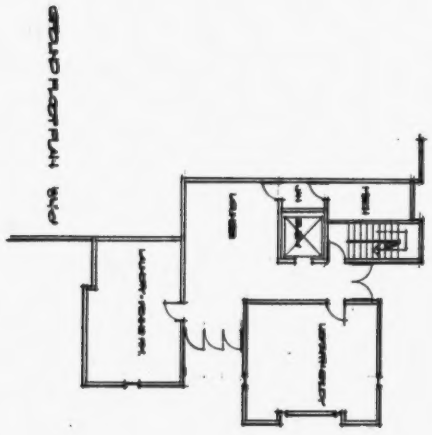


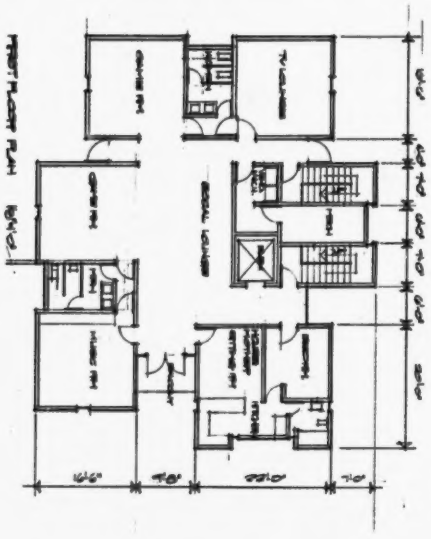
TYPICAL UNIT 'B' FLOOR PLAN 1/4"

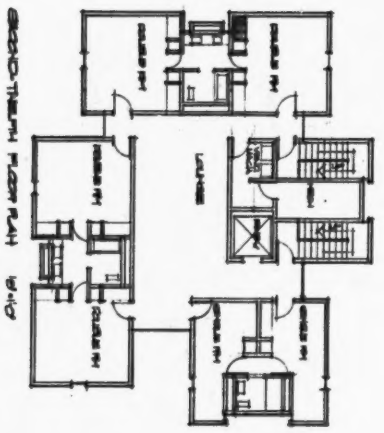
GRADUATE CENTER
DUKE UNIVERSITY

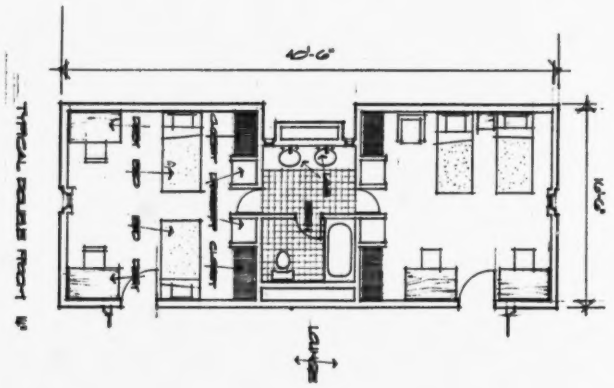
CAUDILL ROWLETT SCOTT
ARCHITECTS PLANNERS ENGINEERS
TEXAS OKLAHOMA CONNECTICUT

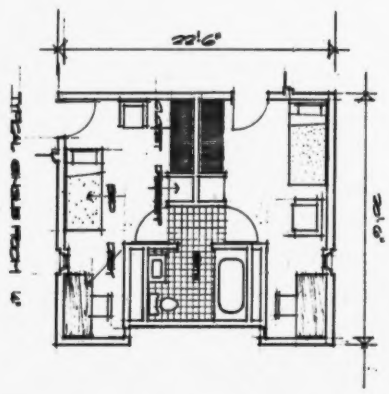
4











CAUDILL ROWLETT SCOTT

GRADUATE CENTER
DUKE UNIVERSITY

ELEVATION STUDY

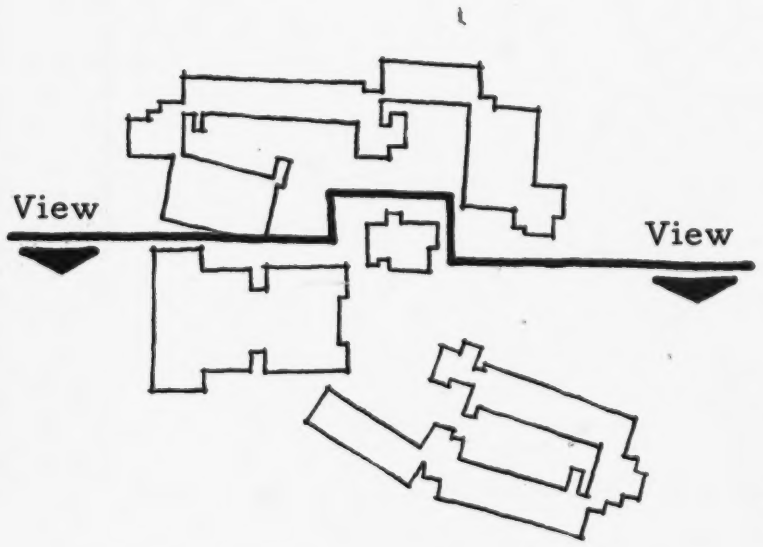
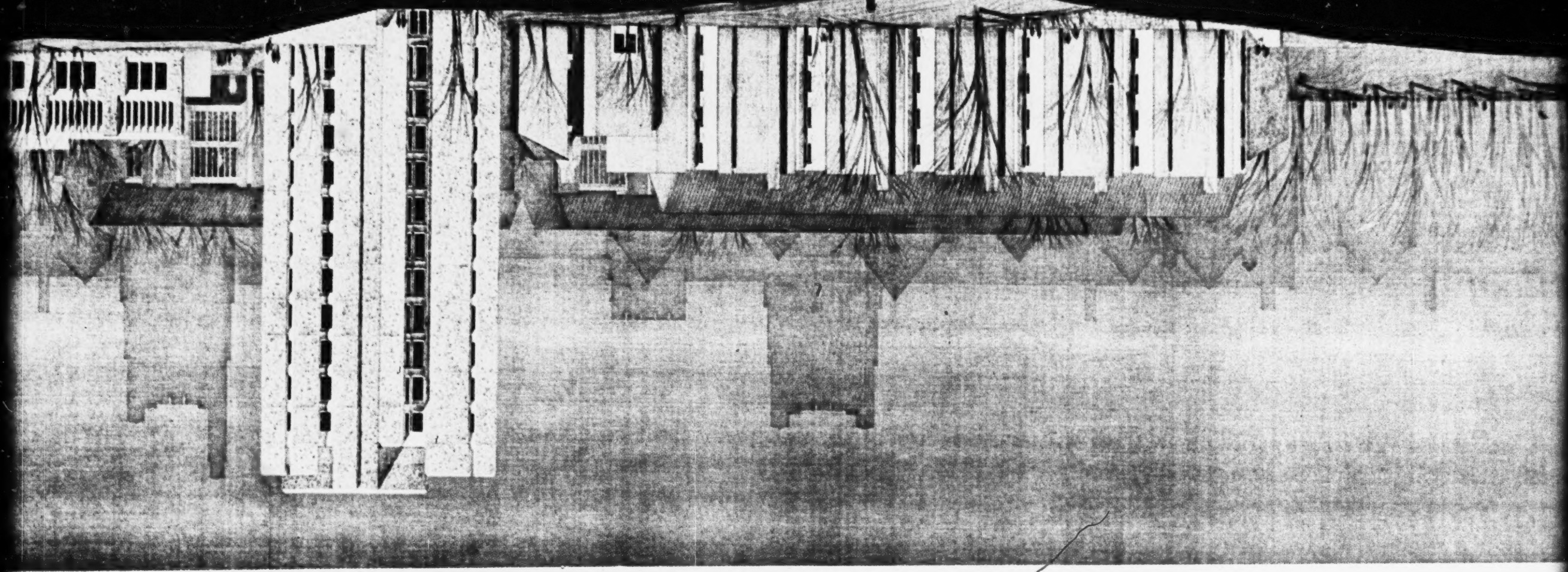
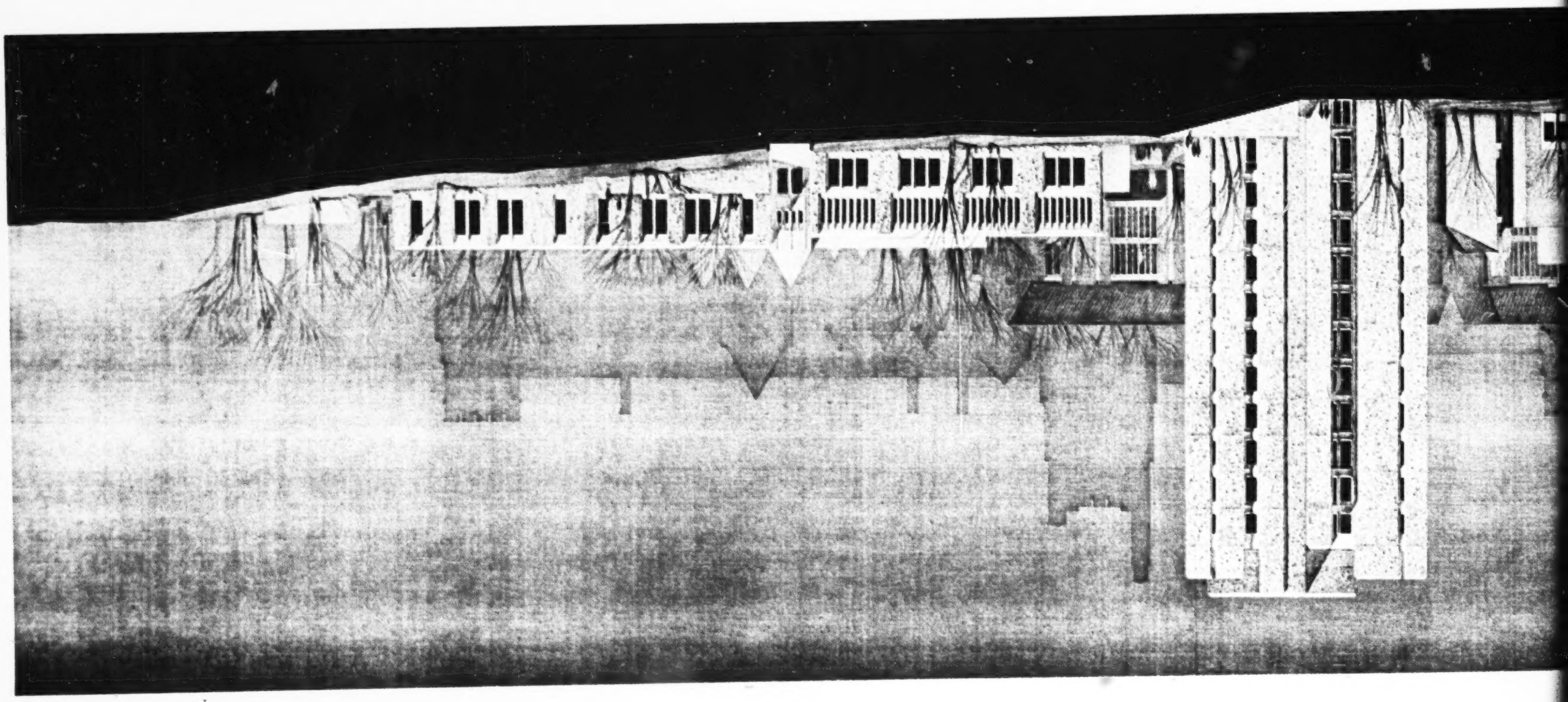
The fold-out at the right is a large scale elevation study through a portion of the Center, looking east toward the existing undergraduate dormitories. The silhouette in the background represents the existing dormitories, as accurately as can be determined from plans and aerial photography. The key map below shows where the view is taken.

Unity. The overall view illustrates unity of materials, scale, and vertical expression, both within the new complex, and with the existing buildings in the background.

Verticality. The height of the tower, and the proportion of wall planes, created mainly by offsets which have their reason in the plan, dramatize the vertical. Alternate bays of different width, the articulation of columns and pipe chases, and the proportions of windows and doors reinforce the vertical feeling.

Variety. The Center expresses considerable variety, through the different structural bays, window arrangements, roof types, building heights, textures, and outdoor spaces resulting from the variety of functions and activities encompassed and the nature of the site.

Scale. Window proportions, panel sizes, stone texture, stairs, and balcony treatment all relate to the human scale.

Richness. Details of panel and stone joinery, stone textures, and treatment of windows, doors, mechanical elements and columns recall the Gothic enrichment of essential elements.

Composition. The proposed building group reflects the additive quality and joinery of the existing Gothic quadrangle.